

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Amendment of the Commission's Rules with	)	GN Docket No. 13-185
Regard to Commercial Operations in the 1695-)	
1710 MHz, 1755-1780 MHz, and 2155-2180 MHz)	
Bands)	

REPORT AND ORDER

Adopted: March 31, 2014

Released: March 31, 2014

By the Commission: Chairman Wheeler and Commissioners Clyburn and Rosenworcel issuing separate statements; Commissioners Pai and O'Rielly approving in part, concurring in part and issuing separate statements.

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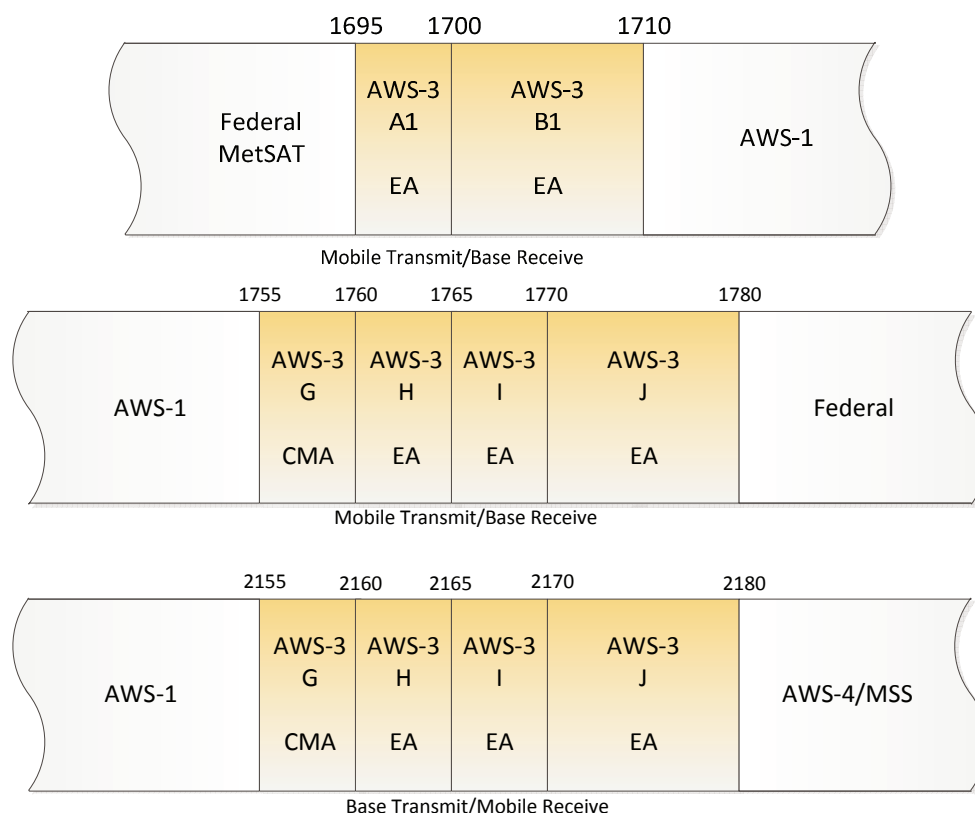
I. INTRODUCTION AND SUMMARY

1. Today we adopt rules governing use of spectrum in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands that will make available significantly more commercial spectrum for Advanced Wireless Services (AWS). We refer to these bands as AWS-3.¹ This additional 65 megahertz of spectrum for commercial use will help ensure that the speed, capacity, and ubiquity of the nation's wireless networks keeps pace with industry demands for wireless service. Today's action is another step in implementing the Congressional directive in Title VI of the Middle Class Tax Relief and Job Creation

¹ In the *AWS-3 NPRM*, the Commission revised its informal nomenclature to refer to four bands as AWS-3: the three bands listed in the text and the 2020-2025 MHz band, which is not governed by the specific statutory provisions and licensing deadline required with respect to the other three bands. See Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands, WT Docket No. 13-185, *Notice of Proposed Rulemaking and Order on Reconsideration*, 28 FCC Rcd 11479, 11481-11482 ¶ 1, n.1 (2013) (*AWS-3 NPRM*). As discussed below, we will address service rules for the 2020-2025 MHz band separately in a subsequent item, following the adjacent AWS-4 licensee's required election whether to use the 2000-2020 MHz band for uplink or for downlink.

Act of 2012 (Spectrum Act) to make more spectrum available for flexible uses.² It also represents a milestone in speeding commercial access to bands through spectrum-sharing arrangements with incumbent Federal users. In particular, 40 megahertz in the band is being made available for commercial use pursuant to collaboration among the wireless industry and Federal agencies facilitated by the Commerce Spectrum Management Advisory Committee (CSMAC) chartered to advise the National Telecommunications and Information Administration (NTIA).

2. We will license the AWS-3 spectrum in two sub-bands. We will pair the 2155-2180 MHz band for downlink/base station operations with the 1755-1780 MHz band for uplink/mobile operations. The 2155-2180 MHz band is already currently allocated for non-Federal, commercial use. The 1755-1780 MHz band is being made available on a shared basis with a limited number of Federal incumbents indefinitely, while many of the Federal systems will over time relocate out of the band. We also adopt rules to allocate and license the 1695-1710 MHz band for uplink/mobile operations on an unpaired shared basis with incumbent Federal meteorological-satellite (MetSat) data users. We will assign AWS-3 licenses by competitive bidding, offering 5 megahertz and 10 megahertz blocks that can be aggregated using Economic Areas (EAs) as the area for geographic licensing, except for 1755-1760/2155-2160 MHz, which will be licensed by Cellular Market Areas (CMAs). The AWS-3 band plan is shown below.



² See Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 126 Stat. 156 (2012) (Spectrum Act).

Block	Frequencies	Pairing	Bandwidth	Area	Licenses
G	1755-1760 and 2155-2160 MHz	2 x 5 MHz	10 MHz	CMA	734
H	1760-1765 and 2160-2165 MHz	2 x 5 MHz	10 MHz	EA	176
I	1765-1770 and 2165-2170 MHz	2 x 5 MHz	10 MHz	EA	176
J	1770-1780 and 2170-2180 MHz	2 x10 MHz	20 MHz	EA	176
A1	1695-1700 MHz	1 x 5 MHz	5 MHz	EA	176
B1	1700-1710 MHz	1 x10 MHz	10 MHz	EA	176

II. BACKGROUND

A. Demand for Flexible Use Spectrum

3. Wireless broadband is a critical component of economic growth, job creation, and global competitiveness and consumers are increasingly using wireless broadband services to assist them in their everyday lives.³ The rapid adoption of smartphones and tablet computers, combined with deployment of high-speed 3G and 4G technologies, is driving more intensive use of mobile networks, so much so that the total number of mobile wireless connections now exceeds the total U.S. population.⁴ As of the second quarter of 2013, 64 percent of U.S. mobile subscribers owned smartphones.⁵ It is predicted that by 2019, almost all handsets in North America will be smartphones and that total smartphone traffic over mobile networks will increase 10 times between 2013 and 2019.⁶ As of June 2013, 34 percent of American adults owned a tablet computer device, an increase from only 18 percent in September 2010.⁷ Tablets

³ Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, WT Docket No. 11-186, *Sixteenth Report*, 28 FCC Rcd 3700, 3929-3931 ¶¶ 361-66 (2013) (*Sixteenth Mobile Wireless Competition Report*); see also Service Rules for the Advanced Wireless Services H Block—Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz bands, WT Docket No. 12-357, *Report and Order*, FCC 13-88 28 FCC Rcd 9483, 9484-9485 ¶ 2 (2013) (*H Block R&O*); Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands, WT Docket Nos. 12-70, 04-356, ET Docket No. 10-142, *Report and Order and Order of Proposed Modification*, 27 FCC Rcd 16102, 16104 ¶ 3 (2012) (*AWS-4 Service Rules R&O*); Connecting America: The National Broadband Plan at 77-79 (*National Broadband Plan*), available at <http://www.broadband.gov/plan/> (last visited March 31, 2014).

⁴ See CTIA – The Wireless Association® A Wireless Industry Survey Results – December 1985 to December 2012 (estimating 326,475,248 total U.S. subscriber connections as of December 2012), available at http://files.ctia.org/pdf/CTIA_Survey_YE_2012_Graphics-FINAL.pdf (last visited March 31, 2014). According to the Bureau of the Census, the combined population of the fifty states, the District of Columbia, and Puerto Rico, as of July 1, 2013, was estimated to be 316.1 million. See U.S. Census Bureau, American Fact Finder, available at http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2013_PEPANNRES&prodType=table (last visited March 31, 2014).

⁵ Nielsen Newswire, The Nielsen Company, *Smartphone Switch: Three-Fourths of Recent Acquirers Chose Smartphones*, (Sept. 17, 2013), available at <http://www.nielsen.com/us/en/newswire/2013/smartphone-switch--three-fourths-of-recent-acquirers-chose-smart.html> (last visited March 31, 2014); Nielsen Newswire, The Nielsen Company, *Two Thirds of New Mobile Buyers Now Opting for Smartphones*, July 12, 2012, available at <http://www.nielsen.com/us/en/newswire/2012/two-thirds-of-new-mobile-buyers-now-opting-for-smartphones.html> (last visited March 31, 2014).

⁶ Ericsson Mobility, Ericsson Mobility Report on the Pulse of the Networked Society, Nov. 2013 at 7 and 11, available at <http://www.ericsson.com/res/docs/2013/ericsson-mobility-report-november-2013.pdf> (last visited March 31, 2014).

⁷ See Kathryn Zickuhr, Pew Internet & American Life Project, “Tablet Ownership 2013” (June 10, 2013), available at <http://pewinternet.org/Reports/2013/Tablet-Ownership-2013.aspx> (last visited March 31, 2014).

generated on average approximately 2.6 times the amount of mobile traffic as the average smartphone in 2013.⁸ All of these trends are resulting in more demand for network capacity and for capital to invest in the infrastructure, technology, and spectrum to support this capacity.⁹ The demand for spectrum, moreover, is expected to continue increasing.¹⁰ In response, both Congress and the President have issued directives to make available additional spectrum for flexible uses, including mobile broadband. The Commission continues to work to make available additional licensed and unlicensed spectrum to meet this growing demand.¹¹

B. National Broadband Plan and Presidential Memoranda

4. Anticipating the growing demand for additional spectrum, the *National Broadband Plan* recommended that the Commission undertake to make 500 megahertz of spectrum available for broadband use within 10 years.¹² The *National Broadband Plan* also recommended that 300 megahertz of this spectrum between 225 MHz and 3.7 GHz be made available for mobile use within 5 years.¹³ And it specifically recommended that the NTIA, in consultation with the Commission, conduct an analysis, of the possibility of reallocating a portion of the 1755-1850 MHz band to pair with the 2155-2175 MHz band.¹⁴ In 2010, the President directed the NTIA to collaborate with the Commission to “make available a total of 500 MHz of Federal and non-Federal spectrum over the next 10 years, suitable for both mobile and fixed wireless broadband use.”¹⁵ Then, in 2013, the President released another memorandum stating that where technically and economically feasible, spectrum sharing can and should be used to enhance efficiency among all users and to expedite commercial access to additional spectrum bands, subject to

⁸ See Cisco White Paper, *Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2013-2018* at 2 (Feb. 5, 2014), available at http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.pdf (*Global Mobile Data Traffic Forecast*) (last visited March 31, 2014).

⁹ See CTIA Semi-Annual Data Survey Results (detailing growth in cumulative capital investment and cell sites).

¹⁰ The Council of Economic Advisors has found that “the spectrum currently allocated to wireless is not sufficient to handle the projected growth in demand, even with technological improvements allowing for more efficient use of existing spectrum and significant investment in new facilities.” Council of Economic Advisors, *The Economic Benefits of New Spectrum for Wireless Broadband* at 5 (Feb. 21, 2012), available at <http://www.whitehouse.gov/administration/eop/cea/factsheets-reports> (last visited March 31, 2014).

¹¹ See, e.g., *H Block R&O*; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, GN Docket No. 12-268, *Notice of Proposed Rulemaking*, 27 FCC Rcd 12357 (2012) (*Incentive Auctions NPRM*) (proposing to hold the world’s first incentive auction of repurposed television broadcast spectrum); *AWS-4 Service Rules R&O*, 27 FCC Rcd 16102 (making 40 megahertz of spectrum available for mobile broadband); Amendment of Part 27 of the Commission’s Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band; Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, WT Docket No. 07-293, IB Docket No. 95-91, *Order on Reconsideration*, FCC 12-130, 27 FCC Rcd 13651 (2012) (acting to free up 30 megahertz of spectrum for mobile broadband); Amendment of the Commission’s Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, GN Docket No. 12-354, *Notice of Proposed Rulemaking and Order*, 27 FCC Rcd 15594 (2012) (pursuing opportunities for innovative sharing use of small cells in 100 megahertz of spectrum in the 3.5 GHz band); Revision of Part 15 of the Commission’s Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, ET Docket No. 13-49, *Notice of Proposed Rulemaking*, 28 FCC Rcd 1769 (2013) (examining the potential to free up 195 megahertz of spectrum in the 5 GHz band suitable for “Gigabit Wi-Fi”).

¹² *National Broadband Plan*, Recommendation 5.8 at 84-85.

¹³ *Id.*

¹⁴ *Id.* at 76 and Recommendation 5.8 at 84-87.

¹⁵ Memorandum of June 28, 2010 - Unleashing the Wireless Broadband Revolution, 75 Fed. Reg. 38387 (July 1, 2010).

adequate interference protection for Federal users, especially users with national security, law enforcement, and safety-of-life responsibilities.¹⁶

C. Section 6401 of the Spectrum Act

5. In February 2012, Congress enacted the Spectrum Act. That Act includes several provisions designed to make more spectrum available for commercial use.¹⁷ It established, among other things, deadlines applicable to both the Secretary of Commerce and the Commission to identify, reallocate, auction, and license, subject to flexible use service rules, spectrum for commercial use.¹⁸ Specifically, the Spectrum Act requires the allocation of spectrum in the following bands for services that support commercial use:

- 25 megahertz at 2155-2180 MHz;
- an additional contiguous 15 megahertz to be identified by the Commission;
- 15 megahertz between 1675-1710 MHz, to be identified by NTIA by February 2013;
- 10 megahertz at 1915-1920 MHz and 1995-2000 MHz, if the Commission finds no harmful interference to the neighboring Personal Communications Service (PCS) band.¹⁹

The Spectrum Act states that the Commission shall grant new initial licenses for all of these bands by February 2015.²⁰ In June 2013 the FCC adopted service rules for the last of these four bands listed above (1915-1920 and 1995-2000 MHz, or the H Block) in a separate FCC proceeding.²¹ The Commission completed the H Block auction on February 27, 2014.²²

6. The Spectrum Act also amended the Commercial Spectrum Enhancement Act (CSEA).²³ In 2004, the CSEA created the Spectrum Relocation Fund (SRF) to streamline the process by which Federal incumbents can recover the costs associated with relocating their spectrum-dependent systems from spectrum bands authorized to be licensed under the Commission's competitive bidding authority.²⁴

¹⁶ Memorandum for the Heads of Executive Departments and Agencies, Expanding America's Leadership in Wireless Innovation (rel. Jun. 14, 2013), published at 78 Fed. Reg. 37431 (June 20, 2013) ("2013 Presidential Memorandum").

¹⁷ Spectrum Act §§ 6001-6703.

¹⁸ See generally *id.*

¹⁹ *Id.* § 6401.

²⁰ *Id.* § 6401(b).

²¹ See *H Block R&O*. See also Service Rules for the Advanced Wireless Services H Block – Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz Bands, WT Docket No. 12-357, *Notice of Proposed Rulemaking*, 27 FCC Rcd 16258 (2012) (*H Block NPRM*). The auction of the H-block licenses started on January 22, 2014. See Auction for H Block Licenses in the 1915-1920 MHz and 1995-2000 MHz Bands Rescheduled for January 22, 2014 Notice of Changes to Auction 96 Schedule Following Resumption of Normal Commission Operations, AU Docket No. 13-178, *Public Notice*, (WTB/AU rel. Oct. 21, 2013).

²² See Auction of H Block Licenses in the 1915-1920 MHz and 1995-2000 MHz Band Closes; Winning Bidder Announced for Auction 96, AU Docket No. 13-178, *Public Notice*, DA 14-279 (WTB/AU rel. Feb. 28, 2014).

²³ Pub. L. No. 108-494, 118 Stat. 3986, 3991 (2004), codified at 47 U.S.C. §§ 309(j), 923(g), 928.

²⁴ See 47 U.S.C. §§ 309(j), 928.

The Spectrum Act extended the CSEA cost reimbursement mechanism for Federal incumbents to include sharing as well as relocation costs, and to facilitate Federal incumbents sharing of spectrum with commercial users by expanding the types of expenditures that can be funded or reimbursed from the SRF.²⁵ These changes are intended to permit agencies to receive funds associated with planning for Commission auctions and relocations, spectrum sharing, the use of alternative technologies, the replacement of existing government-owned equipment with state-of-the-art systems, and the research, engineering studies, and economic analyses conducted in connection with spectrum sharing arrangements, including coordination with auction winners.²⁶ The Spectrum Act also created a new category of allowable pre-auction costs that may, in certain circumstances, be funded before the start of a Commission auction of licenses for applicable eligible frequencies.²⁷

7. The conclusion of any auction of eligible frequencies reallocated from Federal use to non-Federal use or to shared use is contingent on obtaining from such auction cash proceeds amounting to at least 110 percent of the total estimated relocation or sharing costs provided to the Commission by NTIA.²⁸ Once the relocation and sharing costs of the Federal incumbents are covered, however, the remainder of the proceeds attributable to eligible Federal frequencies required to be auction under the Spectrum Act must be deposited in the Public Safety Trust Fund (PSTF) rather than the SRF.²⁹

D. CSEA Transition Planning Process

8. The CSEA also requires the Commission to notify NTIA at least 18 months before the start of an auction of eligible frequencies and for NTIA to notify the Commission of estimated relocation and sharing costs associated therewith, and timelines for such relocation or sharing, at least 6 months before the start of the auction.³⁰ On March 20, 2013, the Commission notified NTIA that it “plans to commence the auction of licenses in the 1695-1710 MHz band and the 1755-1780 MHz band as early as September 2014”³¹ in order to satisfy the Spectrum Act licensing deadline of February 2015. NTIA subsequently notified the affected agencies of their requirement to prepare transition plans.

9. As noted above, the Spectrum Act amended the CSEA to expand the types of costs for which Federal agencies can be reimbursed from the Spectrum Relocation Fund. It also required the Department of Commerce to adopt a common format for Transition Plans, create an expert Technical Panel to review the sufficiency of these transition plans, and adopt a process to resolve disputes regarding the execution, timing, or cost of transition plans.³² The Technical Panel consists of three members, one appointed by the Director of the Office of Management and Budget (OMB), one appointed by the Assistant Secretary of Commerce for Communications and Information, and one appointed by the Chairman of the Federal Communications Commission.³³ Each member must be a radio engineer or a

²⁵ *Id.* § 923(g)(3).

²⁶ *Id.*

²⁷ 47 U.S.C. §§ 923(g)(3) and 928(d)(3).

²⁸ Proceeds attributable to the 2155-2180 MHz, 1915-1920 MHz, and 1995-2000 MHz non-Federal bands must also be deposited in the PSTF. The Spectrum Act establishes the priority for making payments or deposits from the PSTF as amounts are deposited into the Fund. Spectrum Act § 6413(b), codified at 47 U.S.C. § 1457(b).

²⁹ *Id.* § 6401(c)(3), codified at 47 U.S.C. § 309(j)(8)(D)(ii).

³⁰ 47 U.S.C. § 923(g)(4).

³¹ Letter from Julius Genachowski, Chairman, FCC, to Lawrence E. Strickling, Assistant Secretary for Communications and Information, U.S. Department of Commerce at 1 (Mar. 20, 2013) (*FCC March 2013 Letter to NTIA*) (available at <http://go.usa.gov/2VR5>) (last visited March 31, 2014).

³² 47 U.S.C. § 923(h)(1)-(3).

³³ 47 U.S.C. § 923(h)(3)(B); *see* 47 C.F.R. § 301.100.

technical expert.³⁴ The Technical Panel reviews each Federal entity's transition plan and reports on its sufficiency.³⁵

10. The Spectrum Act amendments to the CSEA require Federal agencies authorized to use eligible frequencies to submit a Transition Plan to NTIA and the Technical Panel no later than 240 days (*i.e.*, 8 months) before the auction start date.³⁶ The amendments further require the Technical Panel to submit to NTIA and the applying Federal agency a report on the sufficiency of the Transition Plan no later than 30 days after the submission of the plan (*i.e.*, 7 months, or 210 days, before the auction start date).³⁷ NTIA must make the Transition Plans available on its website with the exception of classified and other sensitive information, no later than 120 days (*i.e.*, 4 months) before the auction start date.³⁸

E. CSMAC Working Groups

11. As discussed in the *AWS-3 NPRM*, NTIA established five joint government/industry working groups within its CSMAC to facilitate the implementation of services that support commercial use in the 1695-1710 MHz and 1755-1850 MHz bands.³⁹ Working Group 1 (WG1) was charged with addressing sharing issues related to the 1675-1710 MHz band,⁴⁰ while Working Groups 2-5 were charged with addressing sharing issues related to Federal operations in the 1755-1850 MHz band.⁴¹ WG1's final

³⁴ 47 U.S.C. § 923(h)(3)(B); *see* 47 C.F.R. § 301.100.

³⁵ 47 U.S.C. § 923(h)(4); *see* 47 C.F.R. § 301.120.

³⁶ 47 U.S.C. § 923 (h)(1).

³⁷ 47 U.S.C. § 923(h)(4); *see* 47 C.F.R. § 301.120(a).

³⁸ 47 U.S.C. § 923(h)(5). *See also* Common Format for Federal Entity Transition Plans, Notice of Inquiry in Docket No. 130809701–3701–01, 78 Fed. Reg. 50396 (Aug. 19, 2013), available at <http://www.gpo.gov/fdsys/pkg/FR-2013-08-19/pdf/2013-20149.pdf>.

³⁹ *See* U.S. Department of Commerce, National Telecommunications and Information Administration, *Framework for Work within CSMAC (NTIA Framework)* (available at http://www.ntia.doc.gov/files/ntia/meetings/framework_for_work_within_csmac_20120525.pdf) (last visited May 14, 2013). NTIA chartered the Commerce Spectrum Management Advisory Committee (CSMAC) in 2004 to advise it on a range of spectrum policy issues. *See* <http://www.ntia.doc.gov/category/csmac>. In January 2011, NTIA amended CSMAC's Charter to permit CSMAC to focus on how best to execute the 2010 Presidential Memorandum and NTIA's Fast Track Plan. *See* U.S. Department of Commerce, *Charter of the Commerce Spectrum Management Advisory Committee* (CSMAC Charter) (available at http://www.ntia.doc.gov/files/ntia/publications/csmac_charter_04012011.pdf) (last visited March 31, 2014). NTIA amended CSMAC's Charter again in 2013. *See* http://www.ntia.doc.gov/files/ntia/publications/csmac_2013_charter.pdf.

⁴⁰ NTIA charged WG1 with recommending proposals that would allow commercial use of the band while lowering any transfer costs and protecting incumbent Federal missions. In July 2012, WG1 began to meet extensively in order to:

- (1) provide refined Long-Term Evolution (LTE) system parameters that more accurately reflect real world deployment scenarios; (2) review operating parameters of Federal systems affected by commercial operations in the 1695-1710 MHz band; (3) modify the existing simulation model used by NTIA to reach the conclusions about use/sharing of the 1695-1710 MHz band; and
- (4) Identify areas for further consideration of possible alternatives that may maximize availability of the spectrum in major market areas.

The full CSMAC approved WG1's Final Report at its February 23, 2013, meeting. *WG1 Final Report* at 1. Commerce Spectrum Management Advisory Committee Final Report Working Group 1 — 1695-1710 MHz Meteorological-Satellite, *Final Report* at 1 (*WG1 Final Report*) (available at <http://www.ntia.doc.gov/other-publication/2013/csmac-wg-1-final-report-v2>) (last visited March 31, 2014).

⁴¹ *See* U.S. Department of Commerce, National Telecommunications and Information Administration, Third Interim Progress Report on the *Ten-Year Plan and Timetable* at 5-8 (Nov. 2012) (*NTIA Fast Track 3rd Interim Report*)

(continued....)

report, adopted by CSMAC on February 21, 2013,⁴² recommended that the Commission adopt a framework for reallocating the 1695-1710 MHz band for commercial use with “Protection Zones.”⁴³ Under this framework, commercial operations could be freely deployed outside of these “Protection Zones.”⁴⁴ Operations inside these “Protection Zones,” however, would require prior successful Federal coordination.⁴⁵ With respect to the 1755-1850 MHz band,⁴⁶ only WG2’s final report was completed before the *AWS-3 NPRM* was released. The Commission noted that the record of the instant proceeding would be informed by NTIA’s subsequent recommendations regarding CSMAC’s then ongoing study of the potential for Federal/non-Federal spectrum sharing.⁴⁷ If NTIA endorsed these reports, the Commission would add them to the record for commenters to discuss in comments, reply comments, or *ex parte* presentations, as appropriate, depending on the timing.⁴⁸

F. DoD Proposal

12. The *AWS-3 NPRM* also sought comment on two specific proposals for facilitating wireless industry access to the 1755-1780 MHz portion of the 1755-1850 MHz band, including the Department of Defense Alternative Proposal (DoD Proposal).⁴⁹ Under the DoD Proposal, the Commission would be able to auction licenses in the 1755-1780 MHz band in the near term, while protecting DoD’s critical capabilities and preserving the flexibility necessary to address the long-term status of the remaining (1780-1850 MHz) portion of this band.⁵⁰ DoD proposed to relocate most of its operations out of the 1755-1780 MHz band by shifting and compressing some operations now at 1755-

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(available at http://www.ntia.doc.gov/files/ntia/publications/third_interim_progress_report_final.pdf) (last visited March 31, 2014).

⁴² Minutes of the CSMAC Meeting on Feb. 21, 2013 at 42 (*CSMAC Feb. 2013 Minutes*) (available at <http://www.ntia.doc.gov/files/ntia/publications/0221ntia.pdf>) (last visited March 31, 2014). CSMAC adopted version 2 of the *WG1 Final Report*, which, relative to the earlier version, had a “slight difference in Appendix 1 for the distances” that define the Protection Zones. *Id.*

⁴³ See *WG1 Final Report* at 2, 5.

⁴⁴ *Id.* at 2.

⁴⁵ *Id.*

⁴⁶ *NTIA Framework* at 3-4. See also *NTIA Fast Track 3rd Interim Report* at 5-8. See generally U.S. Department of Commerce, An Assessment of the Viability of Accommodating Wireless Broadband in the 1755-1850 MHz Band at 1-5 (Mar. 2012) (*NTIA 1755-1850 MHz Assessment Report*) (available at <http://www.ntia.doc.gov/report/2012/assessment-viability-accommodating-wireless-broadband-1755-1850-mhz-band>) (last visited March 31, 2014). See generally U.S. Department of Commerce, An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675-1710 MHz, 1755-1780 MHz, 3500-3650 MHz, 4200-4220 MHz, and 4380-4400 MHz Bands at 2-3-2-4 (Oct. 2010) (*NTIA Fast Track Report*) available at http://www.ntia.doc.gov/files/ntia/publications/fasttrackevaluation_11152010.pdf) (last visited March 31, 2014).

⁴⁷ *AWS-3 NPRM*, 28 FCC Rcd at 11491 ¶ 19.

⁴⁸ *Id.* See also Wireless Telecommunications Bureau and Office of Engineering and Technology Exempt Certain *Ex Parte* Presentations in GN Docket No. 13-185, *Public Notice*, 28 FCC Rcd 12268 (2013).

⁴⁹ Letter from Karl B. Nebbia, Associate Administrator, Office of Spectrum Management, NTIA, to Julius P. Knapp, Chief, Office of Engineering and Technology, FCC, at 1 (July 22, 2013) (GN Docket No. 09-51, ET Docket 10-123) (*NTIA July 2013 Letter*). See also *id.*, Enclosure 1 (Letter from Teresa M. Takai, Chief Information Officer, DoD, to Lawrence E. Strickling, Assistant Secretary for Communications and Information, NTIA, U.S. Dept. of Commerce (July 17 2013). The other proposal was the “Industry Roadmap.” See *AWS-3 NPRM*, 28 FCC Rcd at 11514 ¶ 78.

⁵⁰ *NTIA July 2013 Letter* at 1. See also *id.*, Enclosure 1 (Letter from Teresa M. Takai, Chief Information Officer, DoD, to Lawrence E. Strickling, Assistant Secretary for Communications and Information, NTIA, U.S. Dept. of Commerce (July 17 2013).

1850 MHz into the 1780-1850 MHz band and by relocating other operations on a shared basis to the 2025-2110 MHz band.⁵¹ DoD estimated the cost of implementing its proposal at \$3.5 billion.⁵²

G. NTIA Endorsement of CSMAC Reports and DoD Proposal

13. In a letter filed with the Commission on November 25, 2013, NTIA endorsed the remaining CSMAC reports and transmitted final versions of all five reports to the Commission, which we added to the record of this proceeding.⁵³ NTIA also fully endorsed the DoD Proposal to relocate most of its operations out of the 1755-1780 MHz band and to gain additional access to the 2025-2110 MHz band by adding primary fixed and mobile allocations to the Federal Table of Frequency Allocations limited to certain military operations with protection and priority for non-Federal fixed and mobile operators in the Television Broadcast Auxiliary Service (BAS), the Cable Television Relay Service (CARS), or the Local Television Transmission Service (LTTS).⁵⁴ NTIA clarified that coordination between military and these non-Federal operations should occur via a memorandum of understanding between the Federal and non-Federal fixed and mobile operators.⁵⁵ Under this framework DoD operations would share the 2025-2110 MHz band with BAS, CARS, and LTTS, thus enabling DoD to relocate some military operations from the 1755-1780 MHz band to the 2025-2110 MHz band for those operations that could not compress into the 1780-1850 MHz band or could not relocate to other bands allocated for Federal use.⁵⁶

III. DISCUSSION

A. Bands for AWS-3

14. In the *AWS-3 NPRM*, the Commission proposed AWS-3 service rules for the 1695-1710 MHz, 1755-1780 MHz, 2020-2025 MHz, and 2155-2180 MHz bands. We discuss each band below.⁵⁷

1. 1695-1710 MHz

15. As discussed in the *AWS-3 NPRM*, in accordance with the Spectrum Act's mandate to identify new commercial spectrum for auction, NTIA identified 1695-1710 MHz for commercial services.⁵⁸ The 1695-1710 MHz band is immediately below the AWS-1 uplink band at 1710-1755 MHz. The 1675-1700 MHz band segment is allocated to the meteorological aids service and restricted to radiosonde operation. This portion of the band is also allocated to the MetSat service and is restricted to space-to-Earth operation on a primary basis for Federal and non-Federal use.⁵⁹ The 1700-1710 MHz

⁵¹ *NTIA July 2013 Letter*, Enclosure 1.

⁵² *Id.* Under the DoD Proposal, DoD would not seek access to the 5150-5250 MHz band for telemetry. *Id.*

⁵³ Letter from Karl B. Nebbia, Associate Administrator, NTIA Office of Spectrum Management to Julius Knapp, Federal Communications Commission at 1 (dated Nov. 25, 2013) (*NTIA November 2013 Letter*).

⁵⁴ *Id.* at 2, n.7.

⁵⁵ *Id.*

⁵⁶ *See infra* ¶¶ 210-211.

⁵⁷ *AWS-3 NPRM*, 28 FCC Rcd at 11481 ¶ 1.

⁵⁸ *See* U.S. Department of Commerce, Identification of 15 Megahertz of Spectrum between 1675 and 1710 MHz for Reallocation from Federal Use to Non-Federal Use Pursuant to Section 6401(a) of the Middle Class Tax Relief and Job Creation Act of 2012 (Feb. 2013) (*NTIA 1695-1710 Identification Report*) (available at http://www.ntia.doc.gov/files/ntia/publications/1675-1710_mhz_report_to_president_02192013.pdf) (last visited March 31, 2014).

⁵⁹ The 1660-1670 MHz band is allocated to the radio astronomy service on a primary basis. 47 C.F.R. § 2.106. Footnote US211 states that, in the 1670-1690 MHz band, applicants for airborne or space station assignments are urged to take all practicable steps to protect radio astronomy observations in the adjacent bands from harmful interference. *Id.*

segment is allocated to the fixed and MetSat service on a primary basis for Federal and on a secondary basis for non-Federal use, and restricted to space-to-Earth operation.⁶⁰

a. Uplink Designation, Block Size and Service Area Size

16. *Background.* In the *AWS-3 NPRM*, to implement NTIA's endorsement of the CSMAC WG1 Final Report, the Commission proposed to limit use of the 1695-1710 MHz band to mobile/uplink operations subject to successful coordination with Federal incumbents prior to operation within 27 Protection Zones.⁶¹ To implement this coordination requirement, the Commission proposed to require all uplink operations in this band to transmit only when controlled by an associated base station.⁶² Such base stations located within the 27 Protection Zones would be subject to successful coordination prior to operation of the 1695-1710 MHz uplinks. Additionally, the Commission proposed to license the band in 5 megahertz blocks, noting that a minimum bandwidth of 5 megahertz was necessary to implement the technologies contemplated for the band, and proposed geographic area licensing utilizing 176 Economic Areas (EAs) as the service area size.⁶³

17. Commenters generally agree that we should allow only uplink operations in 1695-1710 MHz.⁶⁴ Raytheon points out that the record is supportive of the Commission's proposal to limit operations in the band to uplink only while prohibiting fixed operations in these frequencies.⁶⁵ T-Mobile does not oppose a requirement that uplink/mobile devices be under the control of, or associated with, a base station as a means to facilitate shared use of the band and prevent interference to Federal operations.⁶⁶

18. Regarding block and area sizes, most commenters agree with the Commission's proposal to license AWS-3 spectrum in 5 megahertz blocks and to implement geographical area licensing utilizing EAs for the 1695-1710 MHz band.⁶⁷ Verizon supports auctioning the AWS-3 spectrum in a combination of 5 and 10 megahertz blocks as these offerings will facilitate the deployment of multiple technologies.⁶⁸ DISH favors auctioning 1695-1710 MHz as a single, unpaired 15 megahertz band.⁶⁹

19. *Discussion.* We conclude that operations in the 1695-1710 MHz should be limited to mobile/uplink operations for commercial operators, and that the band will not be available for fixed uses or air-to-ground operations. We note that the Commission's proposal in this regard was based on NTIA's endorsement of the CSMAC report, which assumed mobile operations up to 20 dBm EIRP,

⁶⁰ The use of the Federal fixed service allocation in this band is restricted by n.G118, which states that Federal fixed stations may be authorized in the 1700-1710 MHz band only if spectrum is not available in the 1755-1850 MHz band. 47 C.F.R. § 2.106, n.G118.

⁶¹ *AWS-3 NPRM*, 28 FCC Rcd at 11493 ¶ 25; 11500-01 ¶ 46.

⁶² *Id.*, at 11501 ¶ 48.

⁶³ *Id.*, at 11501 ¶ 47; 11502 ¶ 52.

⁶⁴ TIA Comments at 11; AT&T Comments at 12; DISH *Ex Parte* dated March 7, 2014, Attach. at 2. One commenter proposed ground-to-air use of 1695-1710 MHz, *see* GoGo, Inc. Comments at 1, but it later determined that such use would not be practical at the mobile power level proposed in the *AWS-3 NPRM*.

⁶⁵ Raytheon Reply Comments at 4. *See also* T-Mobile Comments at 26 ("T-Mobile agrees that the 1695-1710 MHz and 2020-2025 MHz bands are properly characterized as uplink bands given current Information"); Verizon Comments at 24 ("[T]he Commission should prohibit fixed stations in the 1695-1710 MHz and 1755-1780 MHz uplink bands"); TIA Comments at 12; Nokia Comments at 20.

⁶⁶ T-Mobile Comments at 29. T-Mobile proposes an exception that we address in section III.B.6 below.

⁶⁷ Mobile Future Comments at 15; AT&T Comments at 12; T-Mobile Comments at 28; USSC Comments at 21-23.

⁶⁸ Verizon Comments at 15.

⁶⁹ DISH *Ex Parte* dated March 7, 2014, Attach. at 2.

recommending that commercial use of this band be limited to low-power mobile (uplink) transmission. Furthermore, as Verizon notes, in determining the Protection Zones for these bands, the CSMAC did not consider the impact of high gain or tall antennas on government operations.⁷⁰ Additionally, operations in the band will be subject to successful coordination with Federal incumbents in the 27 Protection Zones that we are adopting based on NTIA's endorsement of the CSMAC WG1 Final Report.⁷¹ We believe that the combination of low power, mobile uses along with the designation of the protection zones with coordination requirements will allow commercial and Federal users to co-exist successfully in the band protecting in-band and adjacent band meteorological-satellite receive stations. We also understand that Federal incumbents plan to develop and deploy real-time spectrum monitoring systems for the 1695-1710 MHz band.⁷² We will also require that uplink/mobile devices be under the control of, or associated with, a base station as a means to facilitate shared use of the band and prevent interference to Federal operations.⁷³ We discuss this requirement further in section III.B.6 below (Base station control of mobile or portable devices in 1695-1710 MHz and 1755-1780 MHz bands).

20. We will authorize and license the 1695-1710 MHz band by Economic Areas (EAs)⁷⁴ in one 5 megahertz and one 10 megahertz block, which may be aggregated. Specifically, we will offer a 5 megahertz block at 1695-1700 MHz and a 10 megahertz block at 1700-1710 MHz. Offering the spectrum in 5 and 10 megahertz blocks will support the wide range of technologies contemplated for the band, and will match the configuration of other AWS-3 spectrum. The small 5 megahertz block will also facilitate the opportunity for new entrants and smaller businesses to acquire the right to use this spectrum. Because the blocks can be aggregated, potential bidders and future licensees also have the option to acquire the rights to use both blocks within an EA, *i.e.*, a 15 megahertz band as DISH suggests.

b. Pairing

21. *Background.* In the *AWS-3 NPRM*, the Commission noted that the new AWS-3 band segments could be configured in any number of pairings or even auctioned on an unpaired basis and sought comment on a range of options.⁷⁵ Commenters were asked to address whether and how the AWS-3 band segments should be paired, and were also asked to discuss the competitive effects of the available options. The Commission specifically noted CTIA's earlier proposal to designate 2095-2110 MHz for AWS downlink operations paired with 1695-1710 MHz⁷⁶ and sought comment on CTIA's

⁷⁰ Verizon Comments at 7.

⁷¹ See *infra*, App. A, 47 C.F.R. § 2.106, footnote US88.

⁷² CSMAC WG1 recognized that as a part of the sharing framework there is a need for a clear and consistent coordination process and that a key component of the coordination process is the implementation of a real-time spectrum monitoring capability. See *WG 1 Final Report* at Appendix 1-2.

⁷³ The Protection Zones for the 1695-1710 MHz band are premised on the distance between the incumbent Federal operations and non-Federal base station(s) that will enable the AWS-3 uplink/mobile operations. Thus, even though the base station is receiving rather than transmitting in the 1695-1710 MHz band, its location inside a Protection Zone triggers the coordination requirement. As discussed in the CSMAC WG1 Final Report the 27 Protection Zones actually protect 47 individual federal MetSat receive stations. See *WG 1 Final Report* at Appendix 1.1 Table 1 for a complete list of MetSat receive stations that are protected.

⁷⁴ Economic Areas are geographic areas established by the Bureau of Economic Analysis of the Department of Commerce and used by the Federal Communications Commission to define the coverage of spectrum licenses for certain services. There are 172 EAs, plus 4 EA-like areas, which have been assigned Commission-created EA numbers: 173 (Guam and the Northern Mariana Islands), 174 (Puerto Rico and the United States Virgin Islands), 175 (American Samoa), and 176 (the Gulf of Mexico). See 47 C.F.R. § 27.6(a).

⁷⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11501 ¶ 48.

⁷⁶ See *id.*, at 11491-2 ¶ 20 citing Letter from Steve Largent, President, CTIA, to Julius Genachowski, Chairman, FCC, GN Docket No. 09-51, (dated Mar. 13, 2013) (*CTIA Letter*) (attaching "Finding the FCC's 15 MHz

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recommendation.⁷⁷ In this regard, the Commission also noted prior opposition to CTIA's proposal including a feasibility study that NASA had prepared (NASA Study)⁷⁸ and NTIA's statement that the NASA Study showed that high-density terrestrial base stations or user equipment operating co-frequency in the 2025-2110 MHz band would exceed established protection criteria for the Tracking and Data Relay Satellite System (TDRSS) spaceborne receivers by an average of 16.4 dB to 40.7 dB and that analysis of sharing with satellite systems of other administrations will likely show similar results.⁷⁹

22. Commenters strongly favor pairing the 1695-1710 MHz band.⁸⁰ Moreover, commenters note that pairing the spectrum would allow aggregation of AWS-3 spectrum with AWS-1 spectrum, which would create significantly larger blocks of contiguous paired spectrum that would accommodate higher bandwidths offered by technologies.⁸¹ USCC points out that access to paired spectrum is particularly critical for small and regional carriers, who typically lack sufficient spectrum holdings to pair with newly-acquired spectrum blocks on an asymmetric basis.⁸² Thus, commenters state that offering 1695-1710 MHz on a paired basis would boost auction participation, provide for the creation of a single band class, internationally harmonize the spectrum, and result in significant economies of scale.⁸³ Put differently, Verizon and other commenters state that auctioning the 1695-1710 MHz band as stand-alone uplink spectrum would render it "virtually useless, as it is the downlink spectrum that carriers, both new and incumbent, most require to meet the skyrocketing demand for mobile broadband bandwidth."⁸⁴ They note that auctioning 1695-1710 MHz as stand-alone supplemental uplink would significantly decrease the value of the spectrum, relative to auctioning it paired with downlink spectrum, and would limit both its uses and interested bidders.⁸⁵ T-Mobile opines that seeking a brief delay of the statutory deadline would

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Implementation of Section 6401(b)(2)(E) of the Middle Class Tax Relief and Job Creation Act of 2012 – Identification of 15 Megahertz of Contiguous Spectrum for Mobile Broadband") (CTIA White Paper).

⁷⁷ *AWS-3 NPRM*, 28 FCC Rcd at 11498-99 ¶ 39.

⁷⁸ *Id.* at 11492 ¶ 21 citing Letter from Karl B. Nebbia, Associate Administrator, Office of Spectrum Management, NTIA, to Julius P. Knapp, Chief, Office of Engineering and Technology, FCC, at 1-2 (July 22, 2013) (GN Docket No. 09-51, ET Docket 10-123) ("*NTIA July 2013 Letter*"). See also *id.*, Enclosure 2 (United States of America, *Feasibility Assessment for Accommodation of Mobile Broadband Long Term Evolution (LTE) Systems in the 2 025-2 110 MHz Band*, Document 4-5-6-7/170-E (dated 16 July 2013)).

⁷⁹ *NTIA July 2013 Letter* at 2.

⁸⁰ T-Mobile Reply Comments at 13-14; CEA Reply Comments at 2.

⁸¹ CEA Reply Comments at 5, n.15.

⁸² USCC Comments at 8; USCC Reply Comments at 6-7; Verizon Comments at 4; 4G Americas Comments at 3-4; TIA Comments at 10; T-Mobile Comments at 26-27; AT&T Comments at 4-5.

⁸³ See, e.g., AT&T Comments at 4-5; TIA Comments at 10; Verizon Comments at 7-8; T-Mobile Comments at 13; T-Mobile Reply Comments at 13, n.46.

⁸⁴ Verizon Comments at 4-5; T-Mobile Reply Comments at 13, n.45.

⁸⁵ T-Mobile Comments at 12 ("[T]he band's usefulness for commercial operations will be significantly undermined if it is not paired."); TIA Comments at 12 (noting that the option of auctioning 1695-1710 MHz as a stand-alone uplink band "would make very inefficient use of this block of spectrum," because the "current demand and expected future demand is for additional downlink spectrum . . ."); AT&T Comments at 4-5 (noting that a bidder would be unlikely to bid on separate shards of unpaired spectrum that each might require its own standard as part of a carrier aggregation combination); T-Mobile Reply Comments at 13, n.44. In addition, Verizon points out that because WG-1's evaluation of sharing between certain incumbent operations in 1695-1710 MHz and mobile operations was predicated on use of that band as uplink, the feasibility of using the spectrum for time-division duplex (TDD) operations was not studied. Thus, Verizon believes that because the 1695-1710 MHz band is directly adjacent to the AWS-1 uplink, TDD operations in this band would cause mobile-to-mobile interference from AWS-1 into 1695-1710 MHz and base station-to-base station interference between both bands. As a result, Verizon posits that to support TDD operations, the Commission would need to create an internal guard band in the 1695-1710 MHz band

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be preferable to auctioning and licensing the band unpaired.⁸⁶ In contrast, Raytheon notes that there is no requirement in the Spectrum Act to pair this band.⁸⁷

23. Many commenters strongly preferred pairing 1695-1710 MHz with 2095-2110 MHz, which CTIA previously advocated due to the pair's important ability to use the same duplex spacing as the existing and adjacent AWS-1 band.⁸⁸ Verizon likewise notes that because 2095-2110 MHz is directly adjacent to AWS-1, adopting this pairing configuration will provide a solid foundation for the next generation of wireless networks and services, including those that will utilize LTE-Advanced technology and "could ultimately lead to a unified band plan for the 2 GHz spectrum: 1695-1920 MHz for uplink operations and 1930-2200 MHz for downlink operations."⁸⁹ For this reason, T-Mobile and other commenters initially urged limited relocation of DoD's systems to 2095-2110 MHz.⁹⁰

24. In contrast, Raytheon and Boeing state that 2095-2110 MHz is not an acceptable pairing option for 1695-1710 MHz because the former band supports critical TDRSS communication, which may become critical for manned spaceflight programs,⁹¹ and is currently occupied by Federal users for satellite and non-Federal BAS operations.⁹² Raytheon notes that the NASA Study is a comprehensive analysis showing that shared use of 2095-2110 MHz with AWS operations is infeasible.⁹³ In addition, Raytheon notes that DoD has proposed to relocate some operations in the 1755-1780 MHz band to the 2025-2110 MHz band.⁹⁴ Verizon and others contend that the NASA Study is incomplete and that more information is needed from NASA to properly evaluate any technical challenges with additional uses of that band.⁹⁵

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to prevent or limit the potential interference described above, thereby rendering part of this band unusable for mobile operations. Verizon Comments at 7. See also TIA Comments at 12.

⁸⁶ T-Mobile Reply Comments at 4. 13.

⁸⁷ Raytheon Reply Comments at 7.

⁸⁸ CTIA Comments at 13; T-Mobile Comments at 12; TIA Comments at 11; CCA Comments at 6; NSN Comments at 5.

⁸⁹ Verizon Comments at 7-8; T-Mobile Reply Comments at 13 & 14, n.49.

⁹⁰ See, e.g., T-Mobile Comments at 15-16, Reply Comments at 14. See also AT&T Comments at 8 ("[R]elocation of government systems to 2095-2110 MHz should not be considered at all."); Ericsson Comments at 19-20 (noting that DoD's "proposed relocation to 2025-2110 MHz would likely impact the pairing of 1695-1710 MHz with 2095-2110 MHz," and therefore encouraging the Commission to investigate the potential to accommodate Federal operations in the 2025-2095 MHz band so that 2095-2110 MHz can be left available for commercial services); Engineers for the Integrity of Broadcast Auxiliary Services Spectrum Comments at (raising concerns regarding additional sharing of the 2095-2110 MHz band between existing BAS operations and potentially relocated DoD systems).

⁹¹ Raytheon Reply Comments at ii, 2, 7-9; Boeing Comments at 2-5; T-Mobile Reply Comments at 14, n.50.

⁹² See, e.g., NAB Comments at 3; Raytheon Comments at 39.

⁹³ Raytheon Comments at 39.

⁹⁴ See Raytheon Reply Comments at 8.

⁹⁵ Verizon states that while the study raises concerns that co-channel mobile services could cause satellite-to-satellite interference in the forward-link transmissions from NASA geostationary Tracking and Data Relay Satellite System (TDRSS) to Low Earth Orbit (LEO) satellites, it is impossible to assess the validity of modeling of propagation, antenna performance, LTE system characteristics, and satellite system characteristics without additional information from NASA. Verizon Comments at 8. NASA subsequently provided additional information and updated its study to address the most current internationally-agreed parameters of commercial broadband mobile (LTE) systems. See *NTIA November 21013 Letter* Enclosure 6 "NASA's reply to comments filed with the FCC in response to its AWS-3 NPRM regarding NASA's feasibility assessment for accommodation of mobile broadband long term evolution (LTE) systems in the 2025-2110 MHz band." Boeing states that the Updated NASA Study addresses the concerns raised about the initial NASA Study with respect to assuming unrealistically high numbers of transmitting handsets,

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25. Notwithstanding the fact that the 2095-2110 MHz band initially received the most support as the pairing match for the 1695-1710 MHz band, the wireless industry subsequently recognized difficulties with pairing the 2095-2110 MHz band with the 1695-1710 MHz band. Specifically, the industry acknowledged that the challenges associated with Federal and BAS incumbents in the band would lead to extreme difficulties with allocating, auctioning and licensing 2095-2110 MHz in time to meet the February 2015 deadline for licensing the 1695-1710 MHz band.⁹⁶ Additionally, CTIA, the original proponent of this pairing now asserts that the Commission's highest priority is the clearing of the DoD services at 1755-1780 MHz, and points out that the DoD is actively working with the FCC, broadcasters and other Federal agencies to relocate from the 1755-1780 MHz band into a portion of the Broadcast Auxiliary Services at 2025-2110 MHz.⁹⁷

26. Commenters provided other suggestions on possible candidate bands for pairing with 1695-1710 MHz, but also identified serious or insurmountable obstacles with each suggested match. For example, citing a recent NTIA spectrum-monitoring report that, according to T-Mobile, suggests that the 1370-1390 MHz sub-band is lightly used, T-Mobile identified the 1370-1390 MHz band as a possible candidate for pairing with 1695-1710 MHz. But T-Mobile acknowledges technical limitations that weigh against this pairing, in that the 1370-1390 MHz band suffers from a lack of synergy with existing bands, which in turn would require the use of additional base station amplifiers and antennas.⁹⁸

27. In the *AWS-3 NPRM*, the Commission noted SBE's opposition to CTIA's proposal to use 2095-2110 MHz and its ensuing suggestion to instead consider 2360-2390 MHz as an option for pairing with 1695-1710 MHz. In response to this suggestion, AFTRCC responds that this is a principal band used for flight test telemetry and that an LTE allocation at 2360-2390 MHz would create threats to the continued effective operation of safety-of-life Aeronautical Mobile Telemetry (AMT) operations in the band, and would also jeopardize the successful deployment of Medical Body Area Network (MBAN) devices in hospitals and clinics throughout the country.⁹⁹ Raytheon agrees that the 2360-2395 MHz band is not suitable for pairing with 1695-1710 MHz, not only because of its designation for primary flight testing, but also because it is designated for secondary medical telemetry uses. Moreover, Raytheon notes that the flight test operations occurring in 2360-2395 MHz are incompatible with both the fixed and mobile high density terrestrial operations that are contemplated for 1695-1710 MHz.¹⁰⁰

28. Finally, as another possible alternative, TIA suggests pairing 1695-1710 MHz with 2000-2020 MHz for downlink.¹⁰¹ However, TIA acknowledges that this pairing option is challenging in that it

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and correspondingly high aggregate per city handset transmitter power levels. Specifically, Boeing explains that the initial NASA Study relied on the number of handsets specified by CSMAC Working Group 1, prior to the release of updated specifications by Working Party 5D of the International Telecommunications Union Radiocommunication Sector. Boeing Reply Comments at 6. Because CTIA and other wireless commenters are no longer pursuing the proposal to pair 2095-2110 MHz as the downlink band to be auctioned and licensed paired with 1695-1710 MHz, we reach no conclusions today regarding the initial or updated NASA Studies.

⁹⁶ Verizon Reply Comments at 2.

⁹⁷ CTIA Reply Comments at 12.

⁹⁸ While acknowledging that there would be technical issues with the use of 1370-1390 MHz, T-Mobile asserts that the Commission should nonetheless further evaluate the potential use of this band while, at the same time, also exploring if there are other more optimal pairing options. T-Mobile Reply Comments at 15-16 and n.53.

⁹⁹ AFTRCC Comments at 5.

¹⁰⁰ Raytheon Reply Comments at ii, 2, 9-10.

¹⁰¹ TIA Comments at 11.

would require the adjustment of incumbents licensed for 2000-2020 MHz as well as the utilization of different duplex spacing and filters.¹⁰²

29. *Discussion.* The comments do not identify any particular 15 megahertz of spectrum that can readily pair with 1695-1710 MHz. In the absence of any substantial record support for any such workable pairing at this time, we conclude that the 1695-1710 MHz band should be licensed in an unpaired configuration. We note that no regulation would prohibit licensees from pairing this uplink band with another present or future licensed downlink band. Indeed, our secondary markets and flexible use policies are designed to facilitate the configuration of licenses in their most productive economic use.

2. 1755-1780 MHz

a. Requirement to Identify 15 Megahertz of Contiguous Spectrum for Commercial Use

30. *Background.* As noted above, the Spectrum Act requires the Commission to identify 15 megahertz of contiguous spectrum for commercial allocation and licensing by auction.¹⁰³ In the *AWS-3 NPRM*, the Commission sought comment on appropriate candidates to identify an additional 15 megahertz of contiguous spectrum for commercial use.¹⁰⁴ The Commission proposed, as an example, the identification of the 25 megahertz of contiguous spectrum comprising the 1755-1780 MHz band.¹⁰⁵ The Commission also sought general comment on the allocation of other frequencies in order to meet or surpass this requirement of the Spectrum Act, including CTIA's recommendation of 2095-2110 MHz as the additional 15 megahertz to be paired with 1695-1710 MHz.¹⁰⁶ While several commenters supported CTIA's recommendation,¹⁰⁷ as noted above the record developed on this issue reflects that neither the band identified by CTIA nor any other spectrum is readily available to auction and license paired with 1695-1710 MHz by the statutory deadline of February 2015.¹⁰⁸

31. Several commenters claim that the Commission cannot identify 1755-1780 MHz to meet the statutory requirement and/or that the statute requires us to identify a band that can be used for downlink operations paired with 1695-1710 MHz. According to CTIA, the legislative history of the Spectrum Act makes clear that Congress intended for the Commission to identify 15 megahertz in addition to the 1755-1780 MHz band.¹⁰⁹ CTIA notes that an earlier version of the House bill would have required the Commission to identify 15 megahertz of contiguous spectrum as well as the 1755-1780 MHz band if technically feasible.¹¹⁰ This version of the bill also stipulated that the 15 megahertz identified by

¹⁰² *Id.* at 12.

¹⁰³ *See* 47 U.S.C. § 1451(b)(2)(E).

¹⁰⁴ *AWS-3 NPRM*, 28 FCC Rcd at 11497-99 ¶¶ 36-40 174, n.395.

¹⁰⁵ *Id.* at 11497, 11548 ¶¶ 36, 174, n.395 (noted that the 1755-1780 MHz band “could be identified to meet or exceed the Spectrum Act requirement . . .”).

¹⁰⁶ *See id.* at 11491-2, 11498-9 ¶¶ 20, 39.

¹⁰⁷ *See, e.g.*, Mobile Future Comments at 13; Ericsson Comments at 8; USCC Comments at 7; United States Cellular Corporation Reply Comments at 13-18; CTIA-The Wireless Association Comments at 12; and Telecommunications Industry Association Comments at 11.

¹⁰⁸ *See supra* ¶¶ 21-29.

¹⁰⁹ CTIA Comments at 21; AT&T Reply Comments at 11-12 (“[a]s CTIA notes, Congress’ intent was that the Commission reallocate 15 megahertz from *commercial* allocations to go along with the 15 megahertz between 1675-1710 MHz to be contributed by NTIA for reallocation.”). *See also* USCC Reply Comments at 15.

¹¹⁰ CTIA Comments at note 52 (*citing* H.R. 3630, 112th Cong. §§ 4101(a)(2)(A), (b)(2) (2011) (as passed by the House, December 13, 2011)).

NTIA and the 15 megahertz identified by the FCC were to be paired together and, according to CTIA,¹¹¹ “this is a logical interpretation of the Spectrum Act, as an alternative reading would cause the 1695-1710 MHz band to be orphaned.”¹¹² T-Mobile agrees with CTIA that, based upon the Spectrum Act’s parallel mandates that NTIA and the FCC each identify 15 megahertz of spectrum to be made available for commercial use, “it seems ‘apparent that Congress intended for these two 15 megahertz spectrum bands to complement one another through ready pairing for base and mobile station communications.’”¹¹³ Mobile Future contends that, with the exception of the 2095-2110 MHz band, other spectrum bands considered in the *AWS-3 NPRM* should not be found to satisfy Spectrum Act’s directive that the Commission identify another 15 megahertz of spectrum for commercial use.¹¹⁴

32. Raytheon and NAB disagree with this statutory interpretation. According to Raytheon

Section 6401 of the Spectrum Act simply requires [that 15 MHz of contiguous spectrum] be allocated by the Commission and auctioned in 2015. There is no guidance as to where that spectrum is to be located or indication that it be paired with 1695-1710 MHz band or any other band. (Nothing precludes such a pairing, either.) Similarly, Section 6401 does not provide any direction that the 15 MHz to be auctioned from the 1675-1710 MHz band is to be auctioned on a paired basis. Were the Commission to allocate 1755-1780 MHz, for example, to AWS-3, that action would fully satisfy the unambiguous letter of the statute that an “additional 15 MHz” of spectrum be allocated for commercial broadband use, regardless of which band, if any, 1755-1780 MHz is paired. CTIA’s argument that the legislative history supports a paired allocation for 1695-1710 MHz is unavailing [cite omitted]. Indeed, the fact the final House bill included a provision for 15 MHz in addition to 1755-1780 MHz, whereas the final legislation was silent on allocating 1755-1780 MHz and where the additional 15 MHz is to come from actually leads to the opposite conclusion, namely that 1755-1780 MHz can be the source of the “additional 15 MHz” that Congress requires be auctioned in addition to the specific spectrum bands identified in the Spectrum Act for auction.¹¹⁵

¹¹¹ CTIA Reply Comments at 15 (citing H.R. 3630, 112th Cong. § 4101 (b)(2)(D) (2011) (as passed by the House, December 13, 2011); AT&T Reply Comments at 11; USCC Reply Comments at 14-15.

¹¹² CTIA Reply Comments at 15. USCC adds that “[p]airing the 1755-1780 MHz band with the 1695-1710 MHz band, however, would be illogical. Not only do these bands have disparate bandwidths, but their immediate adjacency to the AWS-1 uplink band weighs strongly in favor of designating both as uplink spectrum.” USCC Reply Comments at 15.

¹¹³ T-Mobile Comments at 12 (quoting *Finding the FCC’s 15 MHz: Implementation of Section 6401(b)(2)(E) of the Middle Class Tax Relief and Job Creation Act of 2012 – Identification of 15 Megahertz of Contiguous Spectrum for Mobile Broadband* (CTIA Proposal), attached to Letter from Steve Largent, President and CEO, CTIA The Wireless Association, to Julius Genachowski, et al., Chairman, FCC, GN Docket No. 09-51 (filed March 13, 2013)).

¹¹⁴ Mobile Future Comments at 12; n.51. Specifically, Mobile Future states that (i) the 1755-1780 MHz band already has been under evaluation for allocation to commercial use for several years, and should not now be considered to satisfy the requirement adopted only last year to allocate and license an additional 15 megahertz of spectrum; and (ii) the 1780-1850 MHz band is not a viable candidate for spectrum to be promptly reallocated and licensed, as NTIA and industry are working toward using that band to accommodate federal operations relocated from the 1755-1780 MHz band. Mobile Future Comments at n.51.

¹¹⁵ Raytheon Reply Comments at 7-8, n.18.

NAB avers that if the Commission were to allocate 1755-1780 MHz, for example, to AWS-3, that action would fully satisfy the unambiguous letter of the statute that an “additional 15 MHz” of spectrum be allocated for commercial broadband use.¹¹⁶

33. *Discussion.* We agree for the reasons set forth above by Raytheon and NAB that the language of the Spectrum Act permits the Commission to “identif[y]” any “[f]ifteen megahertz of contiguous spectrum,” without regard to its current use or whether it is paired or unpaired. The legislative history is not inconsistent with this plain language, as it shows that Congress did not adopt the House bill reflecting the contrary view.¹¹⁷ Accordingly, we are today adopting rules to allocate and license the 1755-1780 MHz band for commercial use, in satisfaction of the Spectrum Act’s requirement for us to identify 15 megahertz of contiguous spectrum in addition to the bands specifically identified in the Act.¹¹⁸ To the extent this entire 25 megahertz band exceeds the requirement of the Spectrum Act to identify 15 megahertz, our action in coordination with NTIA to identify the entire band for commercial use is warranted as integrally related and reasonably ancillary to our mandate under the Spectrum Act (given its pairing with the 2155-2180 MHz band specified in that Act) as well as pursuant to our broad spectrum management authority under Title III of the Communications Act, as amended.¹¹⁹

b. Designation for AWS

34. *Background.* In the *AWS-3 NPRM*, the Commission, noting NTIA’s report on Federal government use of the 1755-1780 MHz band (as part of the larger 1755-1850 MHz band)¹²⁰ and the band’s potential as an extension to existing AWS spectrum,¹²¹ proposed uplink mobile use of the band under technical rules similar to AWS-1 uplinks in the adjacent 1710-1755 MHz band. Such use would be subject to Federal requirements, including coordination with incumbent Federal users, emerging from the CSMAC process, if transmitted by NTIA.¹²² The Commission sought comment on various methods of sharing the 1755-1780 MHz portion of the 1755-1850 MHz band, including the use of Protection Zones, Exclusion Zones, and other measures.¹²³ In case the CSMAC and NTIA were unable to recommend clearly defined sharing parameters, the Commission also sought comment on whether to issue “overlay” licenses that would permit new licensees to gain access to the 1755-1780 MHz band only if they are able to reach coordination agreements with affected Federal users, *i.e.*, “operator-to-operator” coordination.¹²⁴ The Commission also sought comment on two additional proposals that addressed commercial use of the 1755-1780 MHz band: the “Industry Roadmap” submitted by members of the wireless industry and the

¹¹⁶ Raytheon Reply Comments at 7-8, n.18; NAB Reply Comments at 2, NAB Comments at 3-4.

¹¹⁷ See note 110, *supra*. We note that where Congress intended to signal the pairing of bands (as some commenters suggest is the case for 1695-1710 MHz and the 15 megahertz to be identified by the Commission), it used explicit language. See, *e.g.*, the provision cited in note 110, *supra*; S. 911, 112th Cong. 2d Sess., § 302(c) (authorizing the Commission to combine 1755-1780 MHz and 2155-2180 MHz “in an auction of licenses for paired spectrum blocks”). Tellingly, the bill as enacted did not include any requirement to auction “paired” spectrum.

¹¹⁸ 47 U.S.C. § 1541(b)(2)(E).

¹¹⁹ The Spectrum Act grants the Commission authority to implement and enforce that Act “as if . . . a part of the Communications Act of 1934.” 47 U.S.C. § 1403(a). See also *id.* §§ 154(i), 303.

¹²⁰ *AWS-3 NPRM*, 28 FCC Rcd at 11495-6 ¶ 32 citing *NTIA Fast Track Report* at vi. *NTIA 1755-1850 MHz Assessment Report* at 4.

¹²¹ *Id.* at 11496 ¶ 33 citing, *e.g.*, *National Broadband Plan* at 86-87.

¹²² *Id.* at 11496 ¶¶ 33-34.

¹²³ *Id.* at 11513 ¶ 75. As discussed above in para. 11, most of CSMAC’s reports on the 1755-1850 MHz band were completed after release of the *AWS-3 NPRM*.

¹²⁴ *Id.* at 11513 ¶ 76.

“DoD Proposal” submitted by DoD.¹²⁵ In the “Industry Roadmap” the wireless industry assessed Federal operations in the band and proposed to provide industry early access to the 1755-1780 MHz portion of the band.¹²⁶ In the “DoD Proposal,” DoD also proposed to make the 1755-1780 MHz band available for auction in the near term, while protecting critical military capabilities.¹²⁷ Specifically, DoD proposed to modify selected systems operating in the 1755-1780 MHz portion of the band to operate at both 1780-1850 MHz and 2025-2110 MHz, including Small Unmanned Aerial Systems, Tactical Targeting Network Technology, Tactical Radio Relay, and High Resolution Video Systems.¹²⁸ DoD also proposed that its Precision Guided Munitions systems would be modified to operate at 1435-1525 MHz; that its Point-to-Point Microwave Links would be modified to operate at 7125-8500 MHz; and that its DoD Video Surveillance/Robotics systems would be modified to operate at 4400-4940 MHz.¹²⁹ DoD further proposed that specific systems, namely Satellite Operations (SATOPS), Electronic Warfare (EW), Air Combat Training System (ACTS) (where required), and Joint Tactical Radio System (JTRS) at six sites, would continue to operate in the 1755-1780 MHz portion of the band, but would share that spectrum with commercial users.¹³⁰ Finally, DoD proposed to compress its remaining operations into the 1780-1850 MHz portion of the band.¹³¹

35. Apart from the statutory issue described above concerning the “additional 15 megahertz of spectrum to be identified by the Commission,” most commenters strongly favored the Commission’s proposal to designate the 1755-1780 MHz band for commercial use.¹³² Commenters oppose the use of an overlay license approach to licensing the 1755-1780 MHz band, arguing that the use of such a licensing regime is premature until it is determined that clearing the spectrum for commercial users by relocation is not feasible and that mutual sharing mechanisms cannot be adopted.¹³³ Issuing overlay licenses, the commenters further argued, would amount to consigning commercial mobile operations to secondary status, would create uncertainty about the nature of rights the licensee would obtain, and would be inconsistent with the Spectrum Act’s preference to relocate Federal users to the maximum extent feasible.¹³⁴ On the other hand, commenters were generally supportive of the Industry Roadmap and DoD’s Proposal and urged the Commission to coordinate with NTIA to clear Federal operations from the

¹²⁵ *Id.* at 11514-11515 ¶¶ 78-79.

¹²⁶ *Id.*, *AWS-3 NPRM*, citing Letter from Steve Sharkey, T-Mobile U.S., Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket Nos. 10-123, 07-195 (dated Jun. 24, 2013), at Attachment, *Industry Roadmap to Assessing the 1755-1850 MHz Band*. This plan considers making the lower band (1755-1780 MHz) available first, but also addresses the rest of the band up to 1850 MHz in order to meet Federal agencies’ concerns. The plan takes into account the NTIA instructions given to the CSMAC Working Groups, which were directed to consider a plan that lowers the repurposing costs and/or improves or facilitates industry access while protecting Federal operations from adverse impact. *See id.*, T-Mobile Letter, at 1.

¹²⁷ Letter from Karl B. Nebbia, Associate Administrator, Office of Spectrum Management, NTIA, to Julius P. Knapp, Chief, Office of Engineering and Technology, FCC, at 1 (July 22, 2013) (GN Docket No. 09-51, ET Docket 10-123) (*NTIA July 2013 Letter*).

¹²⁸ *Id.* at Attachment.

¹²⁹ *Id.*

¹³⁰ *Id.*

¹³¹ *Id.*

¹³² *See, e.g.*, AT&T Comments at 6. *See also* CTIA Comments at 10-11; CTIA Reply Comments at 4-5; Mobile Future Comments at 3; T-Mobile Reply Comments at 7; CCA Comments at 3; 4G Americas Comments at 3-5; Nokia Solutions and Networks Comments at 3; Verizon Comments at 5; CEA Reply Comments at 2; DISH Reply Comments at 2, 7-8; Motorola Mobility Comments at 4CCA Comments at 3; USCC Comments at 11.

¹³³ AT&T Comments at 10.

¹³⁴ AT&T Comments at 10. *See* Spectrum Act § 6401(a)(3) (codified at 47 U.S.C. § 923(j)).

1755-1780 MHz portion of the 1755-1850 MHz band.¹³⁵ CTIA argues, however, that DoD has not adequately explained or justified the need for the use of the 2025-2110 MHz band and asks why DoD needs to replace access to 25 megahertz of spectrum with access to 85 megahertz of spectrum.¹³⁶

36. On November 25, 2013, NTIA filed a letter enclosing and endorsing CSMAC's final reports and stating that it fully supports the DoD Proposal submitted to the Commission in July 2013, including DoD's proposal to modify certain military systems to operate at both 1780-1850 MHz, which is currently allocated for Federal use, and at 2025-2110 MHz, which is currently allocated for non-Federal fixed and mobile use and used by operators in the Broadcast Auxiliary Service (BAS), the Cable Television Relay Service (CARS), and the Local Television Transmission Service (LTTS).¹³⁷

37. *Discussion.* We note at the outset that some of CSMAC's recommendations regarding sharing are overtaken by the DoD Proposal, under which DoD will relocate most of its operations out of the 1755-1780 MHz band. NTIA has fully endorsed the DoD Proposal and submitted additional details into the record. In light of these actions, we authorize the use of the 1755-1780 MHz band for commercial services in conformance with NTIA's endorsements, the DoD Proposal, and the Spectrum Act.

38. Regarding non-DoD Federal incumbents, NTIA endorsed the findings of WG2 that the two primary video surveillance systems operating in the 1755-1850 MHz band operate in all portions of the band at any time and at any location and thus cannot share the band with commercial operators.¹³⁸ NTIA also endorsed WG2's recommendation that EAs to be transitioned should be ranked according to industry implementation priorities, but then clarified that the industry's prioritized list would serve as an input for consideration as agencies develop their transition plans.¹³⁹

39. NTIA responded to CTIA's claims that DoD has not explained the need for access to the 2025-2110 MHz band or why it needs to replace 25 megahertz of spectrum with access to 85 megahertz of spectrum. NTIA explained that because the military systems that are relocating from the 1755-1780 MHz band to the 2025-2110 MHz band must share the latter band with operators in the BAS, CARS, and LTTS services and must comply with the conditions in two new proposed footnotes to the Table of Frequency Allocations, DoD needs the additional spectrum to ensure that it can maintain comparable capability of current activities.¹⁴⁰ Furthermore, according to NTIA, by having access to 85 megahertz of spectrum, the Federal operations will have the flexibility they need without limiting the existing non-Federal users.¹⁴¹ Under the two new footnotes that NTIA has proposed to the U.S. Table of Frequency Allocations, Federal operations would be limited to the military, and new military operations would be required to be coordinated, via a memorandum of understanding between the Federal and non-Federal fixed and mobile operators in the BAS, CARS, and LTTS.¹⁴²

¹³⁵ See CTIA Comments at 17-18. See also Ericsson Comments at 19; AT&T Comments at 8; and T-Mobile Comments at 14.

¹³⁶ CTIA Comments at 17-18.

¹³⁷ Letter from Karl B. Nebbia, Associate Administrator, NTIA Office of Spectrum Management to Julius Knapp, Federal Communications Commission at 1-2 (dated Nov. 25, 2013) (*NTIA November 2013 Letter*). There are also existing Federal allocations in the band. See *infra* ¶ 210.

¹³⁸ *WG2 Final Report* at 6.

¹³⁹ NTIA Recommendations Letter at 2. *WG2 Final Report* at 12.

¹⁴⁰ *NTIA November 2013 Letter* at 3 and n.10.

¹⁴¹ *Id.*

¹⁴² *Id.* at 2 and n.7 (dated Nov. 25, 2013) (*NTIA November 2013 Letter*).

3. 2155-2180 MHz

40. *Background.* In the *AWS-3 NPRM*, the Commission proposed downlink/base station use of the 2155-2180 MHz band.¹⁴³ Because the 2155-2180 MHz band is immediately above the AWS-1 downlink band (2110-2155 MHz) and immediately below the AWS-4 downlink band (2180-2200 MHz), the Commission proposed to license the 2155-2180 MHz band under rules similar to those it adopted for AWS-1 and AWS-4.¹⁴⁴ Commenters agreed with the Commission's proposal.¹⁴⁵

41. *Discussion.* We adopt the proposal in the *AWS-3 NPRM* to authorize downlink/base station use of the 2155-2180 MHz band. Licensing the 2155-2180 MHz band under technical rules similar to those for the adjacent AWS-1 and AWS-4 spectrum efficiently manages the spectrum, will improve economies of scale for mobile device equipment manufacturing, and is consistent with global standards activity in this frequency range.¹⁴⁶ Moreover, downlink operations in the 2155-2180 MHz band would be compatible with similar operations in the adjacent AWS-1 band (2110-2155 MHz) and AWS-4 band (2180-2200 MHz), thus avoiding the need for guard bands. It would also harmonize the rules applicable to 2155-2180 MHz with AWS-1 and AWS-4 downlink spectrum, thus efficiently managing the spectrum and improving economies of scale for mobile device equipment manufacturing. It would also permit stations already designed for AWS-1 to be easily modified to operate at 2155-2180 MHz band, thus allowing operators to quickly deploy this spectrum for consumer use.¹⁴⁷

4. Band-Plan for 1755-1780 MHz and 2155-2180 MHz

a. Uplink/downlink designations and pairing

42. *Background.* In the *AWS-3 NPRM*, the Commission proposed to allow base and fixed, but not mobile, operations in the 2155-2180 MHz band and to allow mobile transmit operations (but to prohibit high-power fixed and base station operations) in the 1755-1780 MHz band.¹⁴⁸ The Commission sought comment on a range of options that included configuring any of the AWS-3 bands in any number of pairings or auctioning any of the AWS-3 bands on an unpaired basis.¹⁴⁹ Commenters favored allowing base and fixed, but not mobile, operations in the 2155-2180 MHz band and to allow mobile transmit operation (but to prohibit high-power fixed and base stations operations) in the 1755-1780 MHz band.¹⁵⁰ Commenters overwhelmingly favored pairing the 1755-1780 MHz band with the 2155-2180 MHz band.¹⁵¹ According to Verizon, 43 countries are using this spectrum for commercial purposes and 17 of the G-20 countries have allocated this spectrum for commercial use.¹⁵² International harmonization will

¹⁴³ *AWS-3 NPRM*, 28 FCC Rcd at 11495 ¶ 30.

¹⁴⁴ *Id.*

¹⁴⁵ Mobile Future Comments at 9; 4G Americas Comments at 1-2; Ericsson Comments at 7; Nokia Solutions and Networks Comments at 5; Verizon Wireless Comments at 4, Reply Comments at 2; and AT&T Comments at 3-5, Reply Comments at 1.

¹⁴⁶ See Mobile Future Comments at 9. See also 4G Americas Comments at 4.

¹⁴⁷ See Ericsson Comments at 7. See also Mobile Future Comments 8-9.

¹⁴⁸ *AWS-3 NPRM*, 28 FCC Rcd at 11500 ¶ 43.

¹⁴⁹ *Id.* at 11501 ¶ 48.

¹⁵⁰ See Ericsson Comments at 7; AT&T Comments at 12-13.

¹⁵¹ See CTIA Comments at 10-11; TIA Comments at 10; Mobile Future Comments at 3; T-Mobile Comments at 13-14; Dish Networks Reply Comments at 2, 7-8; Nokia Solutions and Networks Comments at 3; Motorola Mobility Comments at 4; Competitive Carriers Association Comments at 3; United States Cellular Corporation Comments at 7; Verizon Comments at 4; AT&T Comments at 3-5; TIA Comments at 10; Boeing Comments at 2; 4G Americas Comments at 1.

¹⁵² See Verizon Comments at 5.

enhance international roaming, create economies of scale that lowers device costs, speed deployment, and reduce interference potential near international borders.¹⁵³

43. *Discussion.* We agree with commenters that we should allow base and fixed, but not mobile, operations in the 2155-2180 MHz band and to allow mobile transmit operations in the 1755-1780 MHz band. We will also prohibit higher-power fixed and base station operations in the 1755-1780 MHz band. Designating the 1755-1780 MHz band for uplink/mobile transmit operations under service rules similar to AWS-1 is consistent with international standards in this frequency range, while designating the 2155-2180 MHz band for downlink operations is compatible with similar downlink operations in the adjacent AWS-1 band at 2110-2155 MHz and the AWS-4 band at 2180-2200 MHz.¹⁵⁴ Moreover, by designating new downlink spectrum adjacent to existing downlink, the industry avoids having to add guard bands or impose significant technical limits between adjacent services, thereby increasing the amount and utility of usable spectrum.¹⁵⁵ As discussed more fully below, we conclude that to facilitate coordination, uplink/mobile devices in the 1755-1780 MHz band must be under the control of, or associated with, a base station as a means to facilitate shared use of the band and prevent interference to Federal operations.¹⁵⁶

44. We also agree with commenters that there are many advantages to pairing these two bands. Pairing the 1755-1780 MHz band with the 2155-2180 MHz band adds 50 megahertz of AWS-3 spectrum to the existing 90 megahertz of AWS-1 spectrum.¹⁵⁷ Thus pairing would allow carriers to combine AWS-1 and the 1755-1780/2155-2180 MHz band in a single 140 megahertz band.¹⁵⁸ The 1755-1780/2155-2180 MHz pair would use the same duplex spacing as the existing AWS-1 band, thus facilitating the availability of new devices that can use this band.¹⁵⁹ Allocation of the 1755-1780 MHz band for commercial use with 2155-2180 MHz also harmonizes the U.S. spectrum allocation of this band with international spectrum allocations.¹⁶⁰ In summary, the record reflects that

[t]he adjacency of these bands . . . will create efficiencies by allowing the same equipment to be used for AWS-1 and AWS-3.¹⁶¹ These benefits apply not only to network infrastructure, but also to end user equipment. This, in turn, will lower deployment costs and speed LTE buildout in this spectrum.¹⁶² As Motorola Mobility

¹⁵³ See Verizon Comments at 5-6; Mobile Future Comments at 8-9.

¹⁵⁴ See Ericsson Comments at 7; 4G Americas Comments at 4.

¹⁵⁵ See Ericsson Comments at 7.

¹⁵⁶ See *infra* ¶¶ 100-102.

¹⁵⁷ See AT&T Comments at 6.

¹⁵⁸ See *id.*

¹⁵⁹ See Motorola Mobility Comments at 4-5.

¹⁶⁰ See Verizon Comments at 5. “By pairing the 1755-1780 MHz band with the 2155-2180 MHz band the FCC will conform the new spectrum to a band plan that is compatible with existing AWS-1 spectrum. As a result, the AWS band will be expanded by 50 MHz to a total of 140 MHz of the 1710-1780 MHz band for mobile uplink transmissions and the 2110-2180 MHz band for base station downlink transmissions. This approach will make substantial spectrum available for new entrants and allow existing licensees to leverage the investments already being made in AWS-1, thereby creating greater economies of scale and lower-cost equipment as well as reducing the risk of harmful interference. Ultimately, this pairing will lead to more rapid deployment of broadband networks to the benefit of consumers and the economy.” *Id.* See also CTIA Reply Comments at 4-5.

¹⁶¹ CTIA Reply Comments at 5 citing, *e.g.*, Mobile Future Comments at 8-9 (“Base stations already designed for the AWS-1 band can be modified easily to use the 2155-2180 MHz band, allowing operators to quickly deploy this spectrum for commercial use.”).

¹⁶² CTIA Reply Comments at 5 citing, *e.g.*, Verizon Wireless Comments at 5 (“This [pairing] approach will make substantial spectrum available for new entrants and allow existing licensees to leverage the investments already

(continued....)

explained, “[t]here would be significant device design benefits to pursuing this pairing. Because the 1755-1780/2155-2180 MHz pairing is symmetrical to the AWS-1 band and has the same duplex spacing, this band could be supported by existing duplexers... [t]hese efficiencies mean that 1755-1780/2155-2180 MHz capabilities likely could be built into devices with minimal additional cost and without a significant impact on battery life, heat production, or other performance characteristics.”¹⁶³

45. Despite these advantages, we note that the Commission is statutorily barred from concluding an auction for “eligible spectrum” such as the 1755-1780 MHz band if the total cash proceeds attributable to such spectrum are less than 110 percent of total estimated relocation or sharing costs.¹⁶⁴

b. Geographic Area Licensing; Service-area size(s)

46. *Background.* In the *AWS-3 NPRM*, the Commission proposed to license all AWS-3 spectrum blocks by EAs and sought comment on alternative approaches.¹⁶⁵ The Commission also sought comment on whether there are costs and benefits to adopting an EA licensing approach for bands to be shared with Federal users.¹⁶⁶

47. Commenters supported one of three different geographic licensing plans: the EA licensing approach proposed by the Commission;¹⁶⁷ a licensing plan based on CMAs,¹⁶⁸ and a hybrid licensing approach where some licenses are based on CMAs and some are based on EAs.¹⁶⁹

48. *Discussion.* We find that there are benefits to adopting a hybrid licensing approach for this spectrum. We note that the Commission adopted a hybrid approach in licensing AWS-1 spectrum based on EAs, Regional Economic Area Groupings (REAGs), and CMAs.¹⁷⁰ In this case, we adopt a hybrid approach and license the 1755-1780 MHz and 2155-2180 MHz bands on an EA and a CMA basis.¹⁷¹

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being made in AWS-1, thereby creating greater economies of scale, and lower-cost equipment as well as reducing the risk of harmful interference.”)

¹⁶³ CTIA Reply Comments at 5 quoting Motorola Mobility Comments at 11.

¹⁶⁴ See 47 U.S.C. §§ 309(j)(16)(B), 1451(b)(3) (FCC shall not conclude any auction of eligible frequencies if the total cash proceeds attributable to such spectrum are less than 110 percent of total estimated relocation or sharing cost). See *infra* ¶¶ 190-191.

¹⁶⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11502-11503 ¶ 52.

¹⁶⁶ *Id.* at 11502-11503 ¶ 52.

¹⁶⁷ AT&T Comments at 12; Mobile Future Comments at 15; Verizon Comments at 13-15.

¹⁶⁸ Bluegrass Cellular, Inc. Comments at 2-5; Blooston Rural Carriers Reply Comments at 1-2; Rural Wireless Association, Inc. Comments at 3; Carolina West Wireless *October Ex Parte* at 3; Competitive Carrier Association *October Ex Parte* at 1-2; Atlantic Seawinds Communications, LLC Comments at 1; Public Service Wireless Services, Inc. Comments at 1; Cellcom Comments at 1; USCC Comments at 26; NTCA-The Rural Broadband Association Reply Comments at 1-4; NTCH, Inc. Reply Comments at 1-2.

¹⁶⁹ T-Mobile Reply Comments at 25.

¹⁷⁰ See 47 C.F.R. § 27.6(h). See also Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands, WT Docket No. 02-353, *Report and Order*, 18 FCC Rcd 25162, 25175-25177 ¶¶ 35-40 (2003) (*AWS-1 Service Rules R&O*).

¹⁷¹ See *supra* note 74. Cellular Market Areas (CMAs) were created from the Metropolitan Statistical Areas (MSAs) defined by the Office of Management and Budget (1-305), the Gulf of Mexico (306), and Rural Service Areas (RSAs) established by the FCC which do not cross state borders (307-734). These RSAs include parts of Puerto Rico not already in an MSA (723-729), U.S. Virgin Islands (730-731), Guam (732), American Samoa (733), and Northern Mariana Islands (734). See, e.g., 47 C.F.R. § 27.6(h)(1) citing *Public Notice Report No. CL-92-40*

(continued....)

49. Adopting a hybrid licensing plan for this spectrum will enable us to achieve several statutory objectives and policy goals. Licensing some areas by CMA will encourage the dissemination of licenses among a variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women, as required by Section 309(j) of the Act.¹⁷² Licensing the 1755-1780 and 2155-2180 MHz bands by EA and CMA we have struck the appropriate balance between the needs of large and small carriers. Licensing some areas by EAs will enable large carriers to minimize post-licensing aggregation costs.¹⁷³ Also, because EAs are nested within MEAs and REAGs, large carriers will be able to aggregate their spectrum into even larger areas, with minimal aggregation costs.¹⁷⁴ We also note that EA license areas are a useful and appropriate geographic unit that the Commission has used for similar bands. Notably, AWS-1 Blocks B and C are licensed on an EA basis.¹⁷⁵ Licensing three spectrum blocks on an EA basis best balances the Commission's goals of encouraging the offering of broadband service both to broad geographic areas and to sizeable populations while licensing one block by CMAs will enable smaller carriers to serve smaller less dense population areas that more closely fit their smaller footprints. Thus, we further find that adopting this hybrid licensing plan will help us to meet other statutory goals, including providing for the efficient use of spectrum;¹⁷⁶ encouraging deployment of wireless broadband services to consumers;¹⁷⁷ and promoting investment in and rapid deployment of new technologies and services.¹⁷⁸ We designate the spectral blocks for CMAs and EAs in the next section on Block size(s).

c. Block size(s)

50. *Background.* In the *AWS-3 NPRM*, the Commission proposed to license the 1755-1780 and 2155-2180 MHz bands on a geographical area basis in 5 megahertz blocks and sought comment on whether it should adopt a plan using different size blocks.¹⁷⁹ Commenters favored one of two approaches: licensing the band by 5 megahertz blocks¹⁸⁰ or licensing the band using a combination of 5 and 10 megahertz blocks.¹⁸¹ Commenters favoring the first approach argue that 5 megahertz blocks align well with a variety of wireless broadband technologies (such as Long-Term Evolution (LTE), Wideband Code Division Multiple Access (W-CDMA), and High-Speed Packet Access (HSPA)), would increase wireless providers' flexibility in auction bidding, and can be aggregated to enable better performance for LTE service and greater bandwidth capacity through wider channels.¹⁸² Commenters that supported a combination of 5x5 megahertz and 10x10 megahertz blocks argue that a combination of license sizes maximizes both utility and efficiency.¹⁸³

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"Common Carrier Public Mobile Services Information, Cellular MSA/RSA Markets and Counties," dated January 24, 1992, DA 92-109, 7 FCC Rcd 742 (1992).

¹⁷² See NTCA Reply Comments at 1.

¹⁷³ See Verizon Comments at 14; Cellcom Comments at 1.

¹⁷⁴ See AT&T Reply Comments at 8.

¹⁷⁵ See *AWS-4 Report and Order*, 27 FCC Rcd at 16122 ¶ 50.

¹⁷⁶ See 47 U.S.C. § 309(j)(3)(D).

¹⁷⁷ See *id.* § 309(j)(3)(A).

¹⁷⁸ See generally *id.* § 309(j)(4)(C)(iii).

¹⁷⁹ *AWS-3 NPRM*, 28 FCC Rcd at 11501 ¶ 47.

¹⁸⁰ Mobile Future Comments at 15; T-Mobile Comments at 28; USCC Comments at 21-23; AT&T Comments at 12.

¹⁸¹ Verizon Comments at 15.

¹⁸² Mobile Future Comments at 15.

¹⁸³ Verizon Comments at 15.

51. *Discussion.* We conclude that licensing the 1755-1780 and 2155-2180 MHz bands in a combination of 5 and 10 megahertz blocks will promote rapid deployment of new technologies and services for the reasons stated below. Thus we adopt the following licensing plan: Block G at 1755-1760/2155-2160; Block H at 1760-1765/2160-2165; Block I at 1765-1770/2165-2170 MHz; and Block J at 1770-1780/2170-2180 MHz. We further determine to license the 1755-1760/ 2155-2160 MHz bands by CMA, and to license the remaining paired blocks by EA.

52. Using a combination of 5 and 10 megahertz blocks and a combination of CMAs and EAs will permit licensees maximum flexibility. Such a combination enables both larger and smaller carriers to participate in an auction of licenses to use this spectrum. Moreover, as commenters note, 5 megahertz blocks align well with a variety of wireless broadband technologies, including LTE, W-CDMA, and HSPA. The larger 10 megahertz block will afford larger carriers the ability to offer higher-bandwidth services, as is common in the 10 megahertz AWS-1 blocks. Such a combination may also facilitate coordination with incumbent Federal agencies. For example, designating the 1755-1760 MHz/2155-2160 MHz as the first channel block avoids frequency overlaps and minimizes potential co-channel interference issues with the Space Ground Link System (SGLS), which operates from 1761-1842 MHz.¹⁸⁴

5. 2020-2025 MHz

53. *Background.* The 2020-2025 MHz band is already allocated for the non-Federal fixed and mobile services and is part of the 35 megahertz (1990-2025 MHz) that the Commission repurposed in 2000 from BAS to emerging technologies such as Personal Communications Services (PCS), AWS, and Mobile Satellite Service (MSS).¹⁸⁵ This repurposing was possible because BAS converted nationwide from seven analog channels (each 17-18 megahertz wide) to seven digital channels (each 12 megahertz wide). In 2004, the Commission proposed to license 2020-2025 MHz for uplink/mobile use paired with 2175-2180 MHz.¹⁸⁶ The Commission did not adopt this proposal and, in 2008 it proposed instead to combine 2175-2180 MHz and 2155-2175 MHz, to make a larger unpaired block at 2155-2180 MHz.¹⁸⁷ The Commission did not make a further proposal for the 2020-2025 MHz band immediately above the AWS-4 uplink band (2000-2020 MHz).

54. In the *AWS-3 NPRM*, the Commission proposed uplink/mobile use of 2020-2025 MHz under rules similar to the AWS-4 rules. Although the Commission did not propose to modify the allocation for this band in the *AWS-3 NPRM*, we proposed changes to several related footnotes in the Table of Frequency Allocations.

55. T-Mobile agrees that 2020-2025 MHz should be cleared to the maximum extent possible and auctioned on a paired basis. T-Mobile states that one option would be for the Commission to consider providing DoD with access to the 2020-2025 MHz band if doing so would allow the 15 megahertz at 2095-2110 MHz to be paired with 1695-1710 MHz. However, T-Mobile states that the most appropriate use of the 2020-2025 MHz band is contingent on the outcome of the then-pending waiver

¹⁸⁴ The space operation service (Earth-to-space) is limited to the band 1761-1842 MHz, and is limited to space command, control, range and range rate systems.

¹⁸⁵ See 47 C.F.R. § 74.690. Of the total 35 megahertz of spectrum, 5 megahertz was authorized for PCS and held by Sprint Nextel; 10 megahertz was authorized for AWS and to be auctioned and licensed as AWS-2; and 20 megahertz was authorized for MSS, though it is now part of the AWS-4 spectrum.

¹⁸⁶ See Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz, and 2175-2180 MHz Bands; Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands; WT Docket Nos. 04-356, 02-35, *Notice of Proposed Rulemaking*, 19 FCC Rcd 19263 (2004) (2004 NPRM).

¹⁸⁷ See Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band, WT Docket No. 07-195, Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz and 2175-2180 MHz Bands, WT Docket No. 04-356, *Further Notice of Proposed Rulemaking*, 23 FCC Rcd 9859, 9860 ¶ 3 (2008) (2008 FNPRM).

request sought by DISH for flexibility to use 2000-2020 MHz for terrestrial downlink.¹⁸⁸ USCC strongly urges the Commission to focus on maximizing the amount of paired spectrum in deciding which bands to license under the AWS-3 service rules. It argues that access to paired spectrum is particularly critical for small and regional carriers that typically lack sufficient spectrum holdings to pair with newly-acquired spectrum blocks on an asymmetric basis.¹⁸⁹

56. The 2020-2025 MHz band is adjacent to the AWS-4 uplink band at 2000-2020 MHz and BAS/CARS/NASA uses at 2025-2110 MHz band. These adjacent uses create challenges with respect to the allocation of this spectrum. EIBASS notes that the band may be at risk of interference from higher-power Electronic News Gathering (ENG) transmitters operating in the 2025-2110 MHz TV BAS band (up to 65 dBm EIRP for ENG platforms vs. 33 dBm EIRP for AWS handsets).¹⁹⁰ This interference would come and go on a seemingly random basis as a mobile ENG transmitter is used near an AWS base station location.¹⁹¹ This could be a challenge to the AWS user as it appears cellular/AWS use is higher at or near locations of newsworthy events, the same events that ENG trucks would be transmitting from.¹⁹² EIBASS notes that DISH has raised the same concern but notes that broadcasters have dealt with high-power PCS/AWS, specialized filters have been developed, and TV BAS into AWS interference should be a manageable problem.

57. DISH states that designating mobile operation in the 2020-2025 MHz band would make this band vulnerable to significant interference from adjacent Federal government and BAS users above 2025 MHz.¹⁹³ DISH states that EIBASS agrees that BAS operations would cause interference to 2020-2025 MHz uplink operations.¹⁹⁴ Regarding EIBASS's view that such interference would be manageable based on PCS/AWS filtering solutions, DISH responds that the existing PCS/AWS to BAS scenario is not representative of the more problematic scenario of interference from BAS into base stations receiving low-power, mobile uplink transmissions in the 2020-2025 MHz band.¹⁹⁵ On the other hand, if 2020-2025 MHz is used for downlinks, DISH agrees with EIBASS that coordination and filtering similar to that used for AWS-1 could be used to protect BAS.¹⁹⁶ Referencing its then-pending waiver request to be able to elect to utilize the 2000-2020 MHz band for downlink operations,¹⁹⁷ DISH suggests that the Commission designate 2020-2025 MHz for downlink use if the adjacent AWS-4 band is also used for downlink.¹⁹⁸ If adjacent AWS-4 band is used for uplink operations, DISH states that 2020-2025 MHz also should be designated for uplinks because downlink operations would cause interference to AWS-4 uplink

¹⁸⁸ T-Mobile Comments at 27. According to T-Mobile, reversing direction of 2000-2020 MHz would generally require that 2020-2025 MHz also be used for downlink. T-Mobile Comments 27-28.

¹⁸⁹ USCC Comments 8; USCC Reply Comments 6-7; *see also* Verizon Comments at 4; 4G Americas Comments at 3-4; TIA Comments at 10; T-Mobile Comments at 26-27; AT&T Comments at 7.

¹⁹⁰ EIBASS Comments at 10.

¹⁹¹ *Id.*

¹⁹² *Id.* at 9-10.

¹⁹³ *See* DISH Reply Comments at 3-4.

¹⁹⁴ *Id.* at 4-5 (*citing* EIBASS Comments at 9-10).

¹⁹⁵ *Id.* at 4.

¹⁹⁶ *Id.* at 5. DISH notes that T-Mobile and Ericsson state that use of the J Block should be contingent on outcome of the DISH waiver. DISH Reply Comments at 6 (*citing* T-Mobile Comments at 27-28; Ericsson Comments at 24).

¹⁹⁷ *See* DISH Network Corporation, Petition for Waiver of Sections 27.5(j) and 27.53(h)(2)(ii) and Request for Extension of Time, WT Docket No. 13-225 (filed Sept. 9, 2013).

¹⁹⁸ DISH Reply Comments at 2; n.6 *citing* DISH Petition for Waiver.

operations, absent severe power and OOB restrictions to protect AWS-4 uplink operations.¹⁹⁹

58. T-Mobile and other commenters believe that the Commission may wish to evaluate how best to use the 2020-2025 MHz band but the future use of the 2020-2025 MHz band is uncertain until DISH decides whether it will be using the adjacent AWS-4 spectrum at 2000-2020 MHz for uplink or downlink operations.²⁰⁰ Sprint supports the auction of 2020-2025 MHz, and recommends that the Commission postpone making a determination on whether the band should be uplink or downlink until after it resolves DISH's waiver petition and Dish makes its election.²⁰¹ T-Mobile states that until that time, it is premature to consider whether it may be used to support commercial wireless operations.²⁰²

59. *Discussion.* On December 20, 2013, the Wireless Telecommunications Bureau granted DISH's request, subject to certain conditions, for flexibility to elect to use 2000-2020 MHz for either uplink or downlink operations.²⁰³ One of the conditions requires DISH to file its uplink or downlink election, which shall apply to all AWS-4 licenses, as soon as commercially practicable but no later than 30 months after the December 20, 2013, release date of the Bureau's order. Auctioning and licensing of the 2020-2025 MHz band is not governed by the February 2015 deadline in the Spectrum Act. We agree with some commenters that the public interest is best served by deferring action on the 2020-2025 MHz band, without prejudice to the ultimate disposition of service rules for that band.

B. Technical Rules

60. In addition to protecting other operations that will remain in the AWS-3 bands, as discussed above, we noted in the *AWS-3 NPRM* that our AWS-3 rules must take into account the potential for AWS-3 operations to cause harmful interference to operations in other service areas, in other AWS-3 blocks and in adjacent frequency bands, including both Federal and non-Federal operations.²⁰⁴ The *AWS-3 NPRM* therefore sought comment on what technical and operational rules were needed to protect these various services from harmful interference. Where possible, we proposed to adopt for AWS-3 the same technical requirements as apply to AWS-1, where our experience indicates that the requirements have facilitated good service while minimizing undesirable interference, and to AWS-4.²⁰⁵ However, we recognized that specific AWS-3 spectrum considerations may warrant different requirements, and we asked commenters to address any specific technical rules that they believe necessary for specific AWS-3 bands.²⁰⁶

61. With respect to adjacent bands, two predominant types of interference can occur. The first is caused by out-of-band emissions (OOBE) that fall directly within the passband of an adjacent-band receiver.²⁰⁷ Such emissions cannot be "filtered out," and can only be mitigated through appropriate

¹⁹⁹ DISH Reply Comments at 5-6.

²⁰⁰ Ericsson is concerned that the Commission's proposed duplex direction of the 2020-2025 MHz band could create coexistence issues in the 2000-2020 MHz band depending on the outcome of the DISH waiver petition.

²⁰¹ Sprint Reply Comments at 2.

²⁰² T-Mobile Reply Comments at 17.

²⁰³ See DISH Network Corporation, Petition for Waiver of Sections 27.5(j) and 27.53(h)(2)(ii) and Request for Extension of Time, WT Docket No. 13-225, *Memorandum Opinion and Order*, 28 FCC Rcd 16787 (WTB 2013).

²⁰⁴ *AWS-3 NPRM*, 28 FCC Rcd at 11516 ¶ 83.

²⁰⁵ Except as noted below, commenters generally supported mirroring AWS-1 technical rules insofar as possible, See, e.g., AT&T Comments at 11-12; T-Mobile Comments at 30; Verizon Comments at 23-24.

²⁰⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11517 ¶ 85.

²⁰⁷ A passband is "[t]he portion of spectrum, between limiting frequencies, that is transmitted with minimum relative loss or maximum relative gain." See Alliance for Industry Telecommunications Solutions, *Glossary*, available online at: <http://www.atis.org/glossary/definition.aspx?id=2835>.

operation of the transmitter. The second type of interference is caused by “receiver overload.” Receiver overload interference occurs when a strong signal from an adjacent band transmission falls just outside the passband of a receiver, where the front-end filter of the receiver can provide only limited attenuation of the unwanted signal.²⁰⁸ Our rules generally limit the potential for both kinds of interference by specifying OOB and power limits.

1. OOB Limits

62. For situations where adjacent spectrum blocks are put to similar uses, our rules commonly require that out-of-band emissions be attenuated below the transmitter power in watts (P) by a factor of not less than $43 + 10 \log_{10}(P)$ dB outside of the licensee’s frequency block.²⁰⁹ Where stricter OOB limits apply, it is typically because adjacent spectrum blocks are put to different uses—high-power downlink in one block and low-power uplink in the other, for example—or because other special protection requirements exist.²¹⁰ Section 27.53(h)(1) of our rules applies this standard limit to AWS-1,²¹¹ and section 27.53(h)(3) specifies the measurement procedure required to determine compliance with the OOB standard.²¹² The *AWS-3 NPRM* sought comment on extending these requirements to the AWS-3 bands.²¹³

a. Interference Protection between Adjacent Block AWS-3 Licensees

63. As the *AWS-3 NPRM* noted, we anticipate that the characteristics of the future AWS-3 band systems will be essentially identical to those of AWS-1. For this reason, the *AWS-3 NPRM* proposed that the typical OOB attenuation factor of $43 + 10 \log_{10}(P)$ dB is appropriate to protect AWS-3 services operating in adjacent spectrum blocks.²¹⁴ No commenter objected to this proposal, and the record does not suggest the presence of any circumstances requiring special OOB protection for adjacent AWS-3 spectrum blocks. We therefore adopt an attenuation factor of $43 + 10 \log_{10}(P)$ dB for emissions outside of AWS-3 licensees’ frequency blocks into other AWS-3 frequency blocks.

b. Interference Protection to Services in Other Bands — Uplink Stations Operating in 1695-1710 MHz and 1755-1780 MHz

(i) Interference protection to operations below 1695 MHz

64. *Meteorological operations:* The 1695-1710 MHz AWS-3 uplink band is adjacent to satellite downlink spectrum at 1675-1695 MHz, which is allocated for Federal and non-Federal satellite use. The rules for the AWS-1 uplink band at 1710-1755 MHz include an OOB attenuation factor of our standard $43 + 10 \log_{10}(P)$ dB in order to protect satellite downlink spectrum currently below 1710

²⁰⁸ *AWS-3 NPRM*, 28 FCC Rcd at 11516 ¶ 84.

²⁰⁹ “[T]he OOB limit that requires licensees to attenuate power levels (P) by at least $43 + 10 \log_{10}(P)$ dB at the edges of their spectrum blocks is commonly employed in other wireless services, and it has generally been found to be adequate in preventing adjacent channel interference.” *AWS-1 Service Rules R&O*, 18 FCC Rcd at 25198 ¶ 91. 47 C.F.R. § 27.53(i) provides that the Commission has authority to require greater attenuation when an OOB causes harmful interference.

²¹⁰ For example, the standard OOB attenuation factor applies generally to AWS-4, but with an additional restriction to provide greater protection to the adjacent 1995-2000 MHz band, since the 2000 MHz boundary separates the AWS-4 uplink band (2000-2020 MHz) from the H-Block downlink band (1995-2000 MHz). 47 C.F.R. § 27.53(h)(1), (2).

²¹¹ 47 C.F.R. § 27.53(h)(1).

²¹² *Id.* § 27.53(h)(3).

²¹³ *AWS-3 NPRM*, 28 FCC Rcd at 11517-19 ¶¶ 86-95.

²¹⁴ *Id.* at 11517 ¶ 87.

MHz.²¹⁵ In addition, section 27.1134(c) of the rules provides that should AWS-1 operations in the 1710-1755 MHz band cause interference to Federal Government operations below 1710 MHz, the AWS-1 licensee must take steps to eliminate the interference.²¹⁶ The *AWS-3 NPRM* stated that the services used in this AWS-3 band will be similar to those in the AWS-1 band, and that the repurposing of 1695-1710 MHz essentially just shifts the boundary between AWS uplink and satellite downlink services down from 1710 to 1695 MHz.²¹⁷ Accordingly, the *AWS-3 NPRM* proposed to specify the same OOB attenuation factor for this AWS-3 uplink band as applies to the adjacent AWS-1 uplink band, the standard $43 + 10 \log_{10}(P)$ dB,²¹⁸ and to extend the obligations of section 27.1134(c) to AWS-3 operations in the 1695-1710 MHz band.²¹⁹

65. One commenter expressed concern that the standard OOB limit may not provide adequate protection for adjacent-band Meteorological Satellite operations. Raytheon argued that, “[b]efore the Commission adopts an OOB limit applicable at the 1695 MHz band edge for AWS-3 systems, sufficient testing and/or analysis should be completed to support the Commission’s determination in light of the [Emergency Managers Weather Information Network] and other operations below 1695 MHz.”²²⁰ Raytheon errs in focusing on just one part of the regime we are establishing to protect the 1675-1695 MHz band. The OOB attenuation factor functions together with the interference-resolution provisions of section 27.1134(c). This combination has worked satisfactorily for the AWS-1 service, and we believe it will serve equally well for AWS-3

66. *Global Positioning System operations:* The GPS Innovation Alliance (GPSIA) argued that the proposed OOB limit for the 1695-1710 MHz band “is no longer effective [in preventing interference to the Global Positioning System (GPS)] given the dramatic increase in RF devices and the [RF] noise floor.”²²¹ It recommended that the Commission defer adopting an OOB limit, and instead participate in a multi-stakeholder task group to develop new GPS spectrum interference standards.²²² CTIA countered that “these issues are best addressed in other fora, and [that] the Commission should not allow these speculative interference concerns to delay this critical spectrum auction.”²²³

67. The Commission has long recognized the importance of GPS and our responsibility to ensure that it receives appropriate interference protection from other radiocommunication services. However, GPSIA’s arguments that the proposed OOB limit *may* present some risk of interference do not warrant deferring action on the proposed OOB limit. GPSIA does not support its claims with technical studies and apparently makes worst-case assumptions regarding emissions from AWS-3 mobiles; *i.e.*, “if appropriate standards are not adopted, manufacturers could begin to produce devices designed with degraded OOB performance”²²⁴ In fact, as GPSIA implicitly concedes, industry standards developed for each radio interface meet or exceed the Commission’s OOB limits, often by significant

²¹⁵ 47 C.F.R. § 27.53(h).

²¹⁶ *Id.* § 27.1134(c).

²¹⁷ *AWS-3 NPRM*, 28 FCC Rcd at 11517 ¶ 88.

²¹⁸ *Id.*

²¹⁹ *Id.* at 11566, App A.

²²⁰ Raytheon Reply Comments at 6.

²²¹ GPSIA Comments at 10. GPS operates in the 1559-1610 MHz Radionavigation-Satellite band, (47 C.F.R. § 2.106) with a center frequency of 1575.42 MHz and a maximum bandwidth of 20.46 MHz, thus occupying the frequencies 1565.19-1585.65 MHz.

²²² GPSIA Comments at 10; GPSIA Reply Comments at 6.

²²³ CTIA Reply Comments at 15-17.

²²⁴ GPSIA Comments at 9.

amounts, and thereby provide an additional margin of interference protection.²²⁵ These standards are developed through open working groups, which GPSIA would be free to participate in.²²⁶ Most significantly, however, there is no evidence—in either the record here or our experience generally—that operations in the AWS-1 band have resulted in harmful interference to GPS. AWS-1 handsets and GPS receivers coexist satisfactorily, even when they reside on the same device.²²⁷ The technical operation in the AWS-1 band is virtually identical to what was proposed for this AWS-3 band: both bands would be populated by low-power mobile devices, both would be governed by the standard $43 + 10 \log_{10}(P)$ dB OOB attenuation factor, and both are similarly separated in frequency from the GPS band. In short, for all these reasons, we believe the possibility of harmful interference to GPS is extremely unlikely.

68. Further, suspending this proceeding to reexamine interference standards would likely make it impossible to meet the statutory requirement that this spectrum be licensed by February 2015.²²⁸ In light of our findings above, we believe that the better course is to proceed based on the record herein. Of course we will continue to explore new ways to maximize spectrum efficiency. For example, in ET Docket No. 13-101 we are considering recommendations of the Commission's Technological Advisory Council regarding the use of harm claim thresholds to improve the interference tolerance of wireless systems.²²⁹ Such proceedings provide a more appropriate vehicle to consider evolution of regulatory requirements, including how to transition incumbents to new standards, if that should be necessary.²³⁰

69. We therefore adopt for the 1695-1710 MHz band an OOB attenuation factor of $43 + 10 \log_{10}(P)$ dB below 1695 MHz.

(ii) Interference protection to operations above 1710 MHz

70. The 1695-1710 MHz AWS-3 uplink band is adjacent to AWS-1 uplink spectrum at 1710-1755 MHz. Because we anticipate that the services used in these adjacent bands will be similar, the *AWS-3 NPRM* proposed to specify the same OOB attenuation factor for this AWS-3 band as applies to the adjacent AWS-1 band, the standard $43 + 10 \log_{10}(P)$ dB.²³¹ No commenter objected to this proposal, and the record does not suggest the presence of any circumstances requiring special OOB protection for the adjacent AWS-1 band. We therefore adopt for this band an OOB attenuation factor of $43 + 10 \log_{10}(P)$ dB above 1710 MHz.

(iii) Interference protection to operations below 1755 MHz

71. Likewise, the 1755-1780 MHz AWS-3 uplink band is adjacent to AWS-1 uplink spectrum at 1710-1755 MHz, where we anticipate similar use. Thus the *AWS-3 NPRM* again proposed the same OOB attenuation factor for this AWS-3 uplink band as applies to the adjacent AWS uplink band, $43 + 10 \log_{10}(P)$ dB.²³² Again, no commenter objected to this proposal, and the record does not suggest the presence of any circumstances requiring special OOB protection for the adjacent AWS-1 band. We therefore adopt for this band an OOB attenuation factor of $43 + 10 \log_{10}(P)$ dB below 1755 MHz.

²²⁵ *Id.*

²²⁶ In addition, parties are free to negotiate private agreements for additional protection, as was the case with the AWS-4 spectrum. *AWS-4 Report and Order*, 27 FCC Rcd at 16152-53 ¶¶ 121-22.

²²⁷ See CTIA Reply Comments at 17.

²²⁸ Spectrum Act § 6401(b)(1)(B).

²²⁹ Office of Engineering and Technology Invites Comments on Technological Advisory Council (TAC) White Paper and Recommendations for Improving Receiver Performance, ET Docket No. 13-101, *Public Notice*, 28 FCC Rcd 5274 (2013).

²³⁰ See generally 2013 Presidential Memorandum at ¶ 5.

²³¹ *AWS-3 NPRM*, 28 FCC Rcd at 11517-18 ¶ 89.

²³² *Id.* at 11517 ¶ 90.

(iv) Interference protection to operations above 1780 MHz

72. The 1755-1780 MHz AWS-3 uplink band is adjacent to Federal operations at 1780-1850 MHz. The *AWS-3 NPRM* observed that the proposal to designate this band for AWS-3 use would merely shift the boundary between AWS and adjacent-band services, with no significant change in the uses on either side of the boundary. The *AWS-3 NPRM* therefore proposed to maintain the OOB attenuation factor for the present boundary (*i.e.*, the AWS-1 limit) for this AWS-3 band, again the standard $43 + 10 \log_{10}(P)$ dB.²³³ No commenters dissented from this proposal, and the record does not suggest the presence of any circumstances requiring special OOB protection for the adjacent Federal operations. We therefore adopt for this band an OOB attenuation factor of $43 + 10 \log_{10}(P)$ dB above 1780 MHz.

c. Interference Protection to Services in Other Bands — Base Stations Operating in 2155-2180 MHz

73. The 2155-2180 MHz AWS-3 downlink band lies between AWS-1 downlink spectrum at 2110-2155 MHz and AWS-4/MSS downlink spectrum at 2180-2200 MHz. Because we anticipate that operations in 2155-2180 MHz and in the adjacent downlink bands will be similar, the *AWS-3 NPRM* proposed that our standard OOB attenuation factor of $43 + 10 \log_{10}(P)$ dB would be sufficient to protect AWS-1 and AWS-4/MSS receivers operating in the adjacent bands.²³⁴ No commenters objected to this proposal, and the record does not suggest the presence of any circumstances requiring special OOB protection for the adjacent AWS-1 and AWS-4/MSS bands. Therefore, we adopt for this band an OOB attenuation factor of $43 + 10 \log_{10}(P)$ dB both below 2155 MHz and above 2180 MHz.

d. Measurement of OOB

74. The Commission's rules generally specify how to measure the power of the emissions, such as the measurement bandwidth. For AWS-1, AWS-4 and PCS, the measurement bandwidth used to determine compliance with this limit for fixed, mobile, and base stations is generally 1 megahertz, with some modification within the first megahertz immediately outside and adjacent to the licensee's frequency block.²³⁵ The *AWS-3 NPRM* proposed to apply this same method to all transmissions in the AWS-3 bands, and sought comment on this proposal.²³⁶ The only party commenting on this proposal supported it.²³⁷ Since there is no opposition to our proposal, and in order to treat the AWS-3 bands in an equivalent manner to other similar bands, we therefore adopt the same requirement for AWS-3 emission limits.

2. Antenna Height Restrictions

75. The *AWS-3 NPRM* proposed that the flexible antenna height rules applicable to AWS-1 base stations should also govern AWS-3 base stations.²³⁸ In addition, since the *AWS-3 NPRM* proposed not to authorize fixed operations in the 1695-1710 MHz and 1755-1780 MHz bands, it tentatively concluded that no special antenna height restrictions are needed for those bands.²³⁹

²³³ *Id.* at 11517 ¶ 91. See also 47 C.F.R. § 27.53(h).

²³⁴ *Id.* at 11517 ¶ 94. See 47 C.F.R. § 27.53(h). See also *AWS-4 Service Rules R&O*, 27 FCC Rcd at 16147 ¶ 106. When held by different licensees, the standard attenuation factor also governs OOB at the AWS-1 and AWS-4 block edges, *e.g.*, between AWS-4 A and B blocks. See *AWS-4 Service Rules R&O*, 27 FCC Rcd at 16125 ¶ 59.

²³⁵ 47 C.F.R. §§ 27.53(h) (AWS bands), 24.238(b) (PCS).

²³⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11519 ¶ 95.

²³⁷ T-Mobile Comments at 30.

²³⁸ *AWS-3 NPRM*, 28 FCC Rcd at 11519 ¶ 97.

²³⁹ *Id.* at 11519-20 ¶ 98.

a. Base Stations (2155-2180 MHz)

76. Part 27 of the Commission's rules does not set out specific antenna height restrictions for AWS-1 base stations. However, pursuant to section 27.56, all services operating under Part 27 are required to limit base station antenna heights to elevations that do not present a hazard to air navigation.²⁴⁰ Additionally, the limitations of field strength at the geographical boundary of the license discussed below effectively limit antenna heights.²⁴¹ As a result, because of these inherent height limitations, the *AWS-3 NPRM* proposed that unique antenna height limits were not needed for AWS-3 facilities, and that the general height restrictions of Part 27 would be sufficient.²⁴²

77. The only comments addressing the issue supported this proposal.²⁴³ As the *AWS-3 NPRM* noted, two rules effectively limit base station antenna heights: section 27.56 regarding safety of air navigation and section 22.55(a) limiting the field strength of base station signals at the edge of a licensee's geographic service area. In addition, Motorola commented that "the need for spectral reuse" provides a third inhibitor of base station antenna height.²⁴⁴ For all these reasons, we find no need for a special restriction on the antenna height of AWS-3 base stations operating in the 2155-2180 MHz band.

b. Fixed Stations (1695-1710 MHz and 1755-1780 MHz)

78. The *AWS-3 NPRM* proposed to prohibit fixed stations²⁴⁵ in the 1695-1710 MHz and 1755-1780 MHz bands, because in defining Protection Zones, CSMAC's assumptions did not consider the possibility of commercial fixed uplinks.²⁴⁶ The *AWS-3 NPRM* therefore tentatively concluded that no antenna height limit would be necessary for these bands.²⁴⁷ Only one party specifically addressed this issue: Verizon stated that "the authorization of fixed high gain antennas in these bands could cause interference to government operations and thus the FCC should prohibit their use in these bands."²⁴⁸ We believe that permitting fixed stations in these uplink bands would unduly complicate sharing with Government incumbents, and that the lack of comments asking us to provide for fixed station use in these bands indicates there is no significant demand for it. We therefore adopt the *AWS-3 NPRM*'s proposal to prohibit fixed stations from operating in the 1695-1710 MHz and 1755-1780 MHz bands. And with no fixed stations in these bands, there is no need for an antenna height limit, so we will not adopt antenna height restrictions for the 1695-1710 MHz and 1755-1780 MHz bands at this time.²⁴⁹

²⁴⁰ 47 C.F.R. § 27.56.

²⁴¹ *Id.* § 27.55(a).

²⁴² *AWS-3 NPRM*, 28 FCC Rcd at 11519 ¶ 97.

²⁴³ Motorola Comments at 6; T-Mobile Comments at 31; Verizon Comments at 24.

²⁴⁴ Motorola Comments at 6.

²⁴⁵ A fixed station is "a station in the fixed service," which consists of stations at specified fixed points that communicate with each other. 47 C.F.R. § 27.4.

²⁴⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11500 ¶¶ 44-46. "A fixed station with a relatively high transmitting antenna is, with regard to the out-of-band emissions it can place into an adjacent band receiver, indistinguishable from a base station operating at the same antenna height." *AWS-1 Service Rules R&O*, 18 FCC Rcd 25162, 25204 n.279 (2003).

²⁴⁷ *AWS-3 NPRM*, 28 FCC Rcd at 11519 ¶ 98. The *AWS-3 NPRM* did propose a height limit for fixed stations in the 2020-2025 MHz band. *Id.* We need not consider that proposal now, however, because we are deferring adoption of rules for this band. See *supra* ¶¶ 53-59.

²⁴⁸ Verizon Comments at 24. No commenter opposed the *AWS-3 NPRM*'s proposals on this issue.

²⁴⁹ For AWS-1, the Commission's rules specify a height restriction of 10 meters for fixed stations operating in AWS-1 uplink spectrum in order to protect co- and adjacent-channel Federal operations. 47 C.F.R. § 27.50(d); *AWS-3 NPRM*, 28 FCC Rcd at 11519 ¶ 98.] For AWS-4 there is no corresponding Federal coordination issue, so the AWS-4 rules do not impose a height restriction. *AWS-3 NPRM*, 28 FCC Rcd at 11519 ¶ 98.

3. Power Limits

79. We will apply the existing AWS-1 EIRP limits to the AWS-3 downlink band at 2155-2180 MHz, as proposed in the *AWS-3 NPRM*.²⁵⁰ The *AWS-3 NPRM* proposed to depart from the AWS-1 EIRP limits for the AWS-3 uplink bands at 1695-1710 MHz and 1755-1780 MHz, because CSMAC and NTIA recommendations for sharing these bands with Federal incumbents were based on assumed baseline LTE uplink characteristics, which specify that lower EIRP levels would be used.²⁵¹ Consistent with our policy supporting flexible use where possible, we are not adopting technical rules requiring AWS-3 licensees to comply with LTE or any other particular industry standard. Nonetheless, we are adopting Protection Zones for Federal incumbents based on the power levels used for the CSMAC studies, while also requiring larger Protection Zones that would apply should AWS-3 licensees propose to operate uplink stations above 20 dBm EIRP.²⁵²

a. Base Stations (2155-2180 MHz).

80. *Background:* The current AWS-1 rules limit base station power in non-rural areas to 1640 watts EIRP for emission bandwidths less than 1 megahertz and to 1640 watts per megahertz EIRP for emission bandwidths greater than 1 megahertz,²⁵³ and double these limits (3280 watts EIRP or 3280 watts/MHz) in rural areas.²⁵⁴ The AWS-1 rules also require that licensees with base stations employing transmit power above 1640 watts EIRP and 1640 watts/MHz EIRP coordinate with affected licensees authorized to operate within 120 kilometers (75 miles) and with certain satellite entities.²⁵⁵ Parallel provisions apply to broadband PCS and AWS-4 stations.²⁵⁶

81. The *AWS-3 NPRM* proposed to apply similar requirements to AWS-3 base stations operating in the 2155-2180 MHz band because these rules have provided good service while avoiding harmful interference.²⁵⁷ Specifically, the *AWS-3 NPRM* proposed to limit base station power in non-rural areas to 1640 watts EIRP for emission bandwidths less than 1 megahertz and to 1640 watts per megahertz EIRP for emission bandwidths greater than 1 megahertz, and double these limits (3280 watts EIRP or 3280 watts/MHz) in rural areas. For AWS-3 base stations with transmit power above 1640 watts EIRP and 1640 watts/MHz EIRP, the *AWS-3 NPRM* proposed to require coordination with the following licensees authorized to operate within 120 kilometers (75 miles) of the AWS-3 base or fixed station: all Broadcast Radio Service (BRS) licensees authorized in the 2150-2162 MHz band and all AWS licensees authorized to operate on adjacent frequency blocks in the AWS-3 band, the 2110-2155 MHz band or the 2180-2200 MHz band.²⁵⁸ Because of the spectral separation between the 2155-2180 MHz band and the

²⁵⁰ *AWS-3 NPRM*, 28 FCC Rcd at 11520-21 ¶¶ 100-101.

²⁵¹ *AWS-3 NPRM*, 28 FCC Rcd at 11521-22 ¶¶ 102-103. These assumptions were set out in Appendix 3 of the *WGI Final Report*. *WGI Final Report*, App. 3 (Baseline LTE Uplink Characteristics). This document reflects the consensus of the LTE Technical Characteristics group of the CSMAC Working Groups. Participants included numerous Federal and non-Federal representatives. *Id.* at 1.

²⁵² See *infra*, App. A, 47 C.F.R. § 2.106, footnote US88.

²⁵³ 47 C.F.R. § 27.50(d)(2).

²⁵⁴ *Id.* § 27.50(d)(1).

²⁵⁵ *Id.* § 27.50(d)(3). See Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies to Provide Spectrum-Based Services, WT Docket No. 02-381, *Report and Order and Further Notice of Proposed Rule Making*, 19 FCC Rcd 19078, 19133-34 ¶ 100-101 (2004).

²⁵⁶ 47 C.F.R. §§ 24.232(a), (b) (PCS), 27.50(d) (AWS-4). The AWS-4 limits supersede a 32 dBW limit that previously governed ATC stations in the 2180-2000 MHz band. See *ICO Waiver Order*, 24 FCC Rcd at 188 ¶ 47; *TerreStar Networks Inc.*, 25 FCC Rcd 228, 235-36 ¶ 23-24 (IB 2010).

²⁵⁷ *AWS-3 NPRM*, 28 FCC Rcd at 11517 ¶ 88.

²⁵⁸ *Id.* at 11517 ¶ 101. BRS stations' primary rights to operate in this band will sunset in 2021. See *infra* ¶ 99.

2025-2110 MHz satellite band, however, the *AWS-3 NPRM* did not propose to require coordination with these operators.²⁵⁹

82. *Discussion:* Commenters generally supported the Commission's proposed technical rules, specifically advocating adoption of regulations consistent with those applicable to the AWS-1 spectrum;²⁶⁰ no commenter opposed the proposals for base station power limits. The Commission typically adopts the same rules for similar adjacent band services, and we see no compelling reason to do otherwise here. Accordingly we adopt the AWS-3 base station power limits proposed in the *AWS-3 NPRM* and described in the preceding paragraph.

b. Mobile and Portable Stations (1695-1710 MHz and 1755-1780 MHz)

83. *Background:* For AWS uplink bands, our rules specify different power limits for different bands, depending on each band's particular circumstances. AWS-4 uplinks are generally limited to 2 watts EIRP,²⁶¹ while AWS-1 uplinks are limited to 1 watt EIRP²⁶² in order to simplify coordination with Government operations that remain in the AWS-1 uplink band,²⁶³ a situation that the AWS-4 band did not present.²⁶⁴ In this respect the two AWS-3 uplink bands under consideration here are similar to the AWS-1 uplink band in that they all contain Government operations, and this circumstance requires careful consideration of the power limit in order to assure satisfactory sharing of the bands with Government incumbents.

84. As described above, in conducting studies for coexistence of commercial and Federal systems in the AWS-3 uplink bands, CSMAC made assumptions about the power output of typical commercial user equipment for the purpose of defining Protection Zones. Specifically, CSMAC assumed that typical commercial user equipment will be LTE devices.²⁶⁵ The LTE standard sets a maximum transmitter power output (TPO) of 23 dBm.²⁶⁶ CSMAC's analysis indicates that such devices will have an actual EIRP varying between -40 dBm and 20 dBm,²⁶⁷ however, due to power control and typical antenna gains/losses. CSMAC used these EIRP values to assume a maximum power of 20 dBm EIRP (100 mW) for the purpose of defining the Protection Zones.²⁶⁸ For this reason, the Commission proposed to limit power to the 20 dBm EIRP for mobiles and portables operating in the 1695-1710 MHz and 1755-1780 MHz bands.²⁶⁹

²⁵⁹ *Id.*

²⁶⁰ See, e.g., Mobile Future Comments at 9; Motorola Comments at 5; 4G Americas Comments at 12; TIA Comments at 10; AT&T Comments at 11; Verizon Comments at 23; T-Mobile Reply Comments at 19, n.70.

²⁶¹ 47 C.F.R. § 27.50(d)(7) (fixed, mobile, and portable (hand-held) stations operating in the 2000–2020 MHz band are limited to 2 watts EIRP, except that the total power of any portion of an emission that falls within the 2000–2005 MHz band may not exceed 5 milliwatts). The former ATC rules originally specified a power limit of 1 dBW (1.25 watts) EIRP in a bandwidth of 1.23 megahertz for mobiles operating in 2000-2020 MHz. *Id.* § 25.252(b)(1) (2003).

²⁶² *Id.* § 27.50(4).

²⁶³ *AWS-1 Service Rules Report and Order*, 18 FCC Rcd at 25200 ¶ 98.

²⁶⁴ *AWS-4 Service Rules Report and Order*, 27 FCC Rcd at 16157-60.

²⁶⁵ *WG1 Final Report* at 1.

²⁶⁶ 3rd Generation Partnership Project (3GPP), Technical Specification Group Radio Access Network, Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception (Release 11) Table 6.2.2-1 (3GPP TS 36.101 v11.1.0, June 2012) (LTE Standard, Table 6.2.2-1), available at http://www.3gpp.org/ftp/Specs/archive/36_series/36.101/36101-b40.zip (last visited March 31, 2014).

²⁶⁷ *WG1 Final Report*, App. 3 at 2-4, (Table, Tabulated CDF Data).

²⁶⁸ *Id.*, App. 7 at 2.

²⁶⁹ *AWS-3 NPRM*, 28 FCC Rcd at 11522 ¶ 103.

85. The Commission also noted its intent to adopt flexible-use service rules for the AWS-3 band supporting terrestrial wireless service and that it was not proposing to mandate the use of any industry standard. In this regard, the Commission observed that similar commercial mobile services such as PCS, AWS-1, and the 700 MHz band deploy handsets using a variety of technologies, including CDMA and UMTS, as well as LTE, whose devices most commonly operate at a maximum EIRP of 23 dBm (200 mW) regardless of higher FCC power limits²⁷⁰ such as the maximum EIRP limit of 1 watt (30 dBm) for the AWS-1 uplink band. Recognizing that the Commission's technical rules will govern all devices nationwide, rather than typical devices operating near Federal incumbents, the Commission sought comment on whether the benefits of a higher power limit would outweigh the increased burden of having to coordinate more commercial operations with Federal incumbents.²⁷¹ The *AWS-3 NPRM* further proposed that mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.²⁷²

86. *Discussion:* While the 20 dBm EIRP figure is a reasonable assumption from which to determine the area where the potential for interference requires coordination with incumbents, a power limit higher than proposed is feasible, so long as the size of the Protection Zones reflects whatever limit we adopt so that, if a licensee proposes to operate above 20 dBm EIRP, this higher power factors into the coordination analysis.

87. Wireless industry commenters nearly unanimously supported the benefits of a higher power limit over the increased burden of coordination. AT&T suggested that a 20 dBm EIRP limit “would effectively require the adoption of a separate 3GPP standard for AWS-3.”²⁷³ Motorola argued that the proposed 20 dBm limit is inherently flawed because it was based on the 23 dBm total power output limit set by the LTE standard, less 3 dB in assumed losses from issues such as negative antenna gain. Actual losses, it said, will be greater, which justifies a higher power limit in the Commission's rules.²⁷⁴ Further, Motorola notes the important role of automatic power control in mobile networks, citing a 3GPP simulation showing that “the average transmit power across all devices in a mobile network is below 1 dBm and that 95 percent of all devices transmit with a power below 7 dBm.”²⁷⁵ DISH makes a similar argument regarding automatic power control, and also notes that the Interference Power Spectral Density level can be controlled by limiting the number of simultaneously transmitting mobiles around Protection Zones, rather than restricting the mobile maximum power to 20 dBm, thus preserving the current Protection Zone boundaries. DISH adds that limiting the number of simultaneous mobile transmissions has an added advantage of providing protection while preserving wireless coverage footprints typical LTE devices can support.²⁷⁶ These commenters suggest a range of alternatives for the AWS-3 uplink power limit, including 23 dBm, 23 dBm +/- 2 dB or 25 dBm (all based on the LTE standard),²⁷⁷ and 30 dBm (the AWS-1 limit).²⁷⁸

88. On the other hand, Raytheon argued that “[f]ailure to mandate an LTE standard could

²⁷⁰ *Id.* at 11521 ¶ 102.

²⁷¹ *Id.* at 11522 ¶ 103.

²⁷² *Id.*

²⁷³ AT&T Comments at 12.

²⁷⁴ Motorola Comments at 8.

²⁷⁵ *Id.*

²⁷⁶ DISH Reply Comments at 11.

²⁷⁷ *See, e.g.*, AT&T Comments at 12; DISH Reply Comments at 10-11; Ericsson Comments at 6-7; Verizon Comments at 24.

²⁷⁸ *See, e.g.*, CTIA Comments at 26-27; Motorola Comments at 9; Nokia Comments at 20; T-Mobile Comments at 32; TIA Comments at 13; USCC Reply Comments at 23-26.

impact directly the validity, already qualified, of the analysis determining the proposed contours of the Protection Zones. . . . [I]f the Commission chooses to forego mandating use of the LTE standard by auction winners, the Commission should establish *larger* Protection Zones to create an umbrella allowing for the use of other standards.²⁷⁹

89. Based on the record before us, we are persuaded that the benefits of a higher EIRP limit outweigh the burden of additional coordination. Therefore, for the sake of uniformity among AWS-1 and AWS-3 equipment requirements and to facilitate industry standard setting in accordance with the basic interoperability requirement that we adopt herein for 1710-1780 MHz stations, we adopt an AWS-3 uplink power limit of 30 dBm EIRP. We emphasize that this EIRP limit is largely a matter of equipment certification and that AWS-3 licensees are not authorized, as a matter of right, prior to successful coordination, to operate mobile and portable stations up to this EIRP limit. Additionally, we agree with Raytheon that the Protection Zones must be properly calibrated to account for any operations above 20 dBm EIRP. We also adopt the *AWS-3 NPRM*'s uncontested proposal to require that mobile and portable stations operating in these bands employ a means for limiting power to the minimum necessary for successful communications.

90. Accordingly, the 27 Protection Zones for 1695-1710 MHz will be defined at two maximum protection distance scenarios: operations up to 20 dBm EIRP, as proposed in the *AWS-3 NPRM*,²⁸⁰ and operations above 20 dBm EIRP up to 30 dBm EIRP.²⁸¹ The Protection Zones are the product of consultations between the Commission and NTIA. For base stations that enable mobiles to operate with a maximum EIRP greater than 20 dBm, up to a maximum EIRP of 30 dBm, nationwide coordination will be required. These requirements reflect the optimum scenarios for AWS-3/Federal sharing of these bands, and provide ample opportunity to ensure that incumbent Federal operations are fully protected. The real-time spectrum monitoring systems that Federal incumbents are planning will also, once deployed, help to maximize commercial use of the band while protecting Federal meteorological-satellite receive stations.²⁸²

91. For the 1755-1780 MHz band, the default Protection Zone is nationwide. Therefore, all AWS-3 operations in this band, including proposals to operate above 20 dBm EIRP, will have to be successfully coordinated with all relevant Federal incumbents. In the coming months, the Commission and NTIA intend to jointly issue one or more public notices establishing coordination procedures and, if possible, more refined Protection Zones for operations up to 20 dBm EIRP. This forthcoming action will not affect operations above 20 dBm EIRP (and up to the 30 dBm EIRP limit) for which the nationwide Protection Zone will remain applicable.

92. We also recognize CSMAC's suggestion that the aggregate signal level from all licensees measured as a power flux density at the geostationary orbit (GSO) arc should not exceed -179 dBW/Hz/m². CSMAC concluded that it is unlikely that the aggregate power flux density from user devices at the GSO arc will reach -179 dBW/Hz/m² and that AWS operations are unlikely to impact Federal Space Operations reception in the GSO arc, assuming user devices operate with a maximum EIRP of 20 dBm. Further, the *WG3 Final Report* indicated that there is a positive 7.6 dB margin at the -179 dBW/Hz/m² power flux density level,²⁸³ and AWS-3 mobile devices will typically operate with

²⁷⁹ Raytheon Comments at 19-20.

²⁸⁰ See *AWS-3 NPRM*, 28 FCC Rcd at 11546-47 ¶ 170.

²⁸¹ See *infra*, App. A, 47 C.F.R. § 2.106, footnote US88.

²⁸² See text accompanying note 72, *supra*.

²⁸³ See *WG3 Final Report* at 7 ("Analysis indicated that aggregate mean interference was estimated to be -212.6 dBW/Hz (7.6 dB) below the safe level)." "In conclusion, analysis found negligible interference predicted to all programs except possibly a few experimental spacecraft." *Id.* "Analysis under current assumptions indicates that aggregate LTE interference to SATOPS spacecraft receivers will not be harmful." *Id.* at 158.

significantly lower EIRP levels than assumed in the *WG3 Final Report*. We nonetheless recognize the legitimate issue of aggregate power flux density possibly affecting incumbent operations and that Federal satellite operators will routinely monitor the aggregate power flux density level at the satellites. AWS-3 licensees are on notice that the Commission will revisit the matter and take appropriate action if it is demonstrated that the aggregate power flux density level from all mobile devices in a 10 megahertz bandwidth in the 1761-1780 MHz band could impact Federal Space Operations reception in the GSO arc, *i.e.*, is approaching -179 dBW/Hz/m².

4. Co-Channel Interference between AWS-3 Systems

93. *Background.* As discussed above, we determine to license AWS-3 on an EA and CMA geographic license area basis.²⁸⁴ The Commission observed in the *AWS-3 NPRM* that should this spectrum be licensed on a less than nationwide basis, it would be necessary to ensure that licensees do not cause harmful interference to co-channel systems operating along their common geographic boundaries.²⁸⁵ To resolve any such interference, the *AWS-3 NPRM* proposed to adopt a boundary limit approach,²⁸⁶ with a boundary field strength limit of 47 dBμV/m, the same as applies to other services similar to AWS-3, including AWS-1 and AWS-4. The *AWS-3 NPRM* noted that some commenters in other proceedings have suggested that the boundary limit be adjusted to accommodate varying channel bandwidths, and sought comment on these options.²⁸⁷ The *AWS-3 NPRM* also sought comment on its proposal that licensees operating in adjoining areas should be permitted to employ alternative, agreed-upon signal limits at their common borders.²⁸⁸ Except for T-Mobile, which argued that the field strength limit be adjusted to accommodate for varying channel bandwidths, commenters did not oppose the Commission's proposals to protect adjacent licensees from co-channel interference.²⁸⁹

94. *Discussion.* We adopt the proposed boundary limit approach for co-channel interference. As discussed above, the Commission will license AWS-3 on a geographic area basis that is less than nationwide, *i.e.*, an EA and CMA basis.²⁹⁰ To prevent licensees that operate systems along common geographic borders from causing harmful interference to one another, the Commission must provide operating limits to ensure such licensees do not cause interference to co-channel systems. Adopting a boundary limit approach establishes a default standard, which will enable licensees to deploy facilities in boundary areas without the need for prior coordination. (Licensees may use this operating limit as a starting point for negotiations to exceed the limits with agreement of adjacent area licensees.²⁹¹) Moreover, in other bands where spectrum has been allocated for fixed and mobile services, similar to AWS-3, the Commission has uniformly adopted the boundary limit method to minimize harmful co-channel interference.²⁹² For instance, the PCS, AWS-1, AWS-4 and H-Block bands all use a boundary limit approach.²⁹³ In response to the Commission's proposal, no commenter supported a coordination requirement rather than the boundary limit approach.²⁹⁴ Consequently, we find that a boundary limit

²⁸⁴ See *supra* ¶¶ 20, 48-49.

²⁸⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11522 ¶ 104.

²⁸⁶ The alternative would be to require prior coordination of base stations located near geographic boundaries.

²⁸⁷ *AWS-3 NPRM*, 28 FCC Rcd at 11522 ¶ 105.

²⁸⁸ *Id.* at 11523 ¶ 108.

²⁸⁹ T-Mobile Comments at 31.

²⁹⁰ See *supra* Section III.A.4 (Band-Plan for 1755-1780 MHz and 2155-2180 MHz).

²⁹¹ See ¶ 98, *infra*.

²⁹² *AWS-3 NPRM*, 28 FCC Rcd at 11522 ¶ 104.

²⁹³ 47 C.F.R. § 24.236 (PCS); *id.* § 27.55(a) (1) (AWS-1, AWS-4 and H Block).

²⁹⁴ See, e.g., T-Mobile Comments at 31.

approach is the best method to address potential harmful co-channel interference between licensees operating in adjacent geographic regions.

95. We set the field strength limit at the boundary at 47 dBμV/m. As the Commission observed in the *AWS-3 NPRM*, in other bands where spectrum has been allocated for fixed and mobile services and licensed for flexible use, similar to AWS-3, the Commission has generally adopted a boundary field strength limit of 47 dBμV/m.²⁹⁵ For example, in the PCS, AWS-1, AWS-4 and H-Block bands, the Commission adopted a field strength limit of 47 dBμV/m at the boundary of licensed geographic areas.²⁹⁶ Because this limit has worked well in limiting co-channel interference in other bands, we find it appropriate to adopt it here for the similarly situated AWS-3.

96. In adopting this boundary limit, we decline to adopt the alternative limit proposed by T-Mobile. While supporting the boundary limit approach used in other bands, T-Mobile asserted that we should modify the boundary limit to set a reference measurement bandwidth, as proposed by Sprint in WT Docket No. 12-357. In making this recommendation, T-Mobile claimed that because today's LTE transmissions operate on wider channels than earlier legacy technologies, a 47 dBμV/m limit will effectively result in a comparatively lower field strength limit. Specifically, T-Mobile proposed to adjust the field strength limit from 47 dBμV/m to 54 dBμV/m per megahertz "which is based on GSM technology and provides a 7 dB increase over today's rules."²⁹⁷

97. Although we agree with T-Mobile that a boundary limit that adjusts for large differences in channel bandwidths may be appropriate, we are not persuaded that either Sprint or T-Mobile's proposed limit represents the most appropriate solution. Sprint derived the value for the field strength based on a comparison against a 30 kHz Digital Amps signal,²⁹⁸ and T-Mobile did not explain how it derived its proposed limit. Other technologies may be a more appropriate reference upon which to base the value for the field strength. Also, there are other metrics that may be used to limit the signal at the boundary, such as power flux density. We observe that the Commission has already adopted a bandwidth-independent approach when setting boundary limits with Canada and Mexico.²⁹⁹ For example, certain international limits are expressed as a power flux density (*i.e.*, dBW/m²/MHz), a measure of power, whereas field strength is a measurement of voltage. As Sprint noted, other parties have proposed to set boundary limits in a bandwidth neutral manner, but there is no established consensus on what the value of the limit should be.³⁰⁰ With no consensus regarding an alternative boundary limit approach, we are not prepared to adopt any particular approach at this time. We intend to explore the issue of whether to apply a measurement bandwidth to co-channel boundary limits in future service rules proceedings, and we encourage all interested parties to explore this issue in such proceedings to develop a full record of the technical concerns and ramifications of such an approach.

98. Finally, we adopt the Commission's proposal that adjacent affected area licensees may voluntarily agree upon higher field strength boundary levels than the 47 dBμV/m we adopt above.³⁰¹ This

²⁹⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11522 ¶ 104.

²⁹⁶ See 47 C.F.R. §§ 24.236, 27.55(a)(1); *cf.* 47 C.F.R. § 27.55(a)(2) (40 dBμV/m field strength limit is used in the 700 MHz services).

²⁹⁷ T-Mobile Comments at 31.

²⁹⁸ *H Block R&O*, 28 FCC Rcd at 9515 ¶ 79.

²⁹⁹ See Letter from Ms. Helen McDonald, Senior Deputy Minister, Spectrum, Information Technologies, and Telecommunications, Industry Canada, to Mr. Julius Genachowski, Chairman, Federal Communications Commission, Attachment B, General Principle 2.8 (July 18, 2011), available at <http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf10066.html> (last visited March 31, 2014).

³⁰⁰ Sprint Reply Comments in WT Docket No. 12-357 at 8, n.30 (citing to Verizon and Verizon Wireless comments in the Broadcast Incentive Auction proceeding proposing 50 dBμV/m per MHz).

³⁰¹ *AWS-3 NPRM*, 28 FCC Rcd at 11523 ¶ 108.

concept is already codified in the field strength rules for both PCS and AWS services. No party opposed extending this approach to AWS-3. Accordingly, to maintain consistency with the PCS and other AWS bands, we permit adjacent area licensees to agree to a higher field strength limit.

5. Co-Channel Interference to BRS Channels 1 and 2

99. The AWS-1 rules include provisions that protect BRS Channel 1 (2150-2156 MHz) and Channel 2/2A (2156-2160/62 MHz) while the band transitions from BRS to AWS use.³⁰² Because these BRS channels will be co-channel to some licenses in the AWS-3 downlink band at 2155-2180 MHz, the *AWS-3 NPRM* proposed that the same AWS-1 provisions in sections 27.1132 and 27.1255 be applied to future AWS-3 licensees operating in the 2155-2180 MHz band.³⁰³ No parties commented on this proposal. Therefore, and in the absence of any compelling reason to do otherwise, we adopt the same provisions in sections 27.1132 and 27.1255 for AWS-3 licensees operating in the 2155-2180 MHz band.

6. Base station control of mobile or portable devices in 1695-1710 MHz and 1755-1780 MHz bands

100. *Background.* In the *AWS-3 NPRM*, we proposed to require mobile or portable devices operating in bands shared with Federal incumbents to be under the control of a base station.³⁰⁴ T-Mobile did not oppose this requirement, but suggested allowing an exception “to allow devices to operate that are not under the control of a base station if that can be accomplished in a manner consistent with protection requirements to Federal operations.”³⁰⁵ Raytheon opposed codifying T-Mobile’s proposed exception, stating that such flexibility might be considered pursuant to a specific coordination scenario as long as Federal agencies are not obligated to consent to such use.³⁰⁶

101. T-Mobile also noted that any control requirement should be consistent with LTE mobile operations, which it described as follows:

Prior to transmitting, LTE user devices listen for system information being broadcast by the base station. Based on the system information, the user device will transmit a RACH (Random Access Channel), in order to get the cell to grant downlink/uplink radio resources. Because the mobile device does not transmit until receiving system information from the base station, the mobile device is clearly under the control of the base station³⁰⁷

102. *Discussion.* As discussed above,³⁰⁸ in order to facilitate Federal coordination, uplink/mobile devices in the 1695-1710 MHz and 1755-1780 MHz bands must be under the control of, or associated with, a base station as a means to facilitate shared use of the band and prevent interference to Federal operations. We agree with T-Mobile that LTE user devices operating as T-Mobile describes would meet this control requirement. However, we are not persuaded to codify the general exception that T-Mobile suggests, because the proposal lacks the specificity necessary to assure us that it would prevent interference to Federal incumbents.

³⁰² 47 C.F.R. §§ 27.1132, 27.1250-27.1255. These BRS provisions will expire in 2021, 15 years after the first AWS license was issued in the band, at which time any remaining BRS licensees in the band will lose primary status. *Id.* §27.1253(a). The Commission’s licensing records reflect that there are fewer than five BRS incumbents licensed on these channels and that most of the stations use Channels 1 and/or 2/2A for fixed broadband uplink.

³⁰³ *AWS-3 NPRM*, 28 FCC Rcd at 11523 ¶ 109.

³⁰⁴ *Id.* at 11563. See also *id.* at 11501 ¶ 48.

³⁰⁵ T-Mobile Comments at 29.

³⁰⁶ Raytheon Reply Comments at 16.

³⁰⁷ T-Mobile Comments at 29.

³⁰⁸ See *supra* ¶¶ 19, 43.

7. Receiver Performance

103. The *AWS-3 NPRM* sought comment on the potential for AWS-3 operations to cause receiver overload or other interference to non-AWS operations below 1695 MHz, above 1780 MHz, above 2025 MHz, and above 2180 MHz.³⁰⁹ No commenter addressed this issue directly, and the only comments suggesting the possibility of interference to adjacent non-AWS services were those urging special OOB protection below 1695 MHz. We have addressed these comments in connection with finalizing the AWS-3 OOB limits,³¹⁰ and no interference issues remain to be considered.

8. Compliance with Industry Standard

104. In response to the Commission's request for comment on any other technical rules that may be required,³¹¹ some commenters encouraged us to mandate use of the LTE air interface standard in the AWS-3 spectrum, while some urged us to adopt an equipment interoperability requirement. In the *AWS-3 NPRM*, the Commission acknowledged that CSMAC made technical assumptions about commercial operations that assumed baseline LTE uplink characteristics and that some technical rules must accommodate CSMAC's assumptions or the Protection Zones might have to be redrawn.³¹² But the Commission emphasized that it was not proposing rules to require AWS-3 licensees to comply with any particular industry standard such as LTE.³¹³ Rather, in accordance with the Spectrum Act,³¹⁴ the Commission intended to propose flexible use service rules for the AWS-3 band.³¹⁵ AIA expressed concern "[w]hether spectrum sharing and coordination rules can be established when there is currently no proposed requirement for AWS-3 licensees to comply with any particular industry standard such as LTE."³¹⁶ And as noted above, Raytheon argued that if the Commission did not mandate use of the LTE standard, it should "establish *larger* Protection Zones to create an umbrella allowing for the use of other standards."³¹⁷ T-Mobile disagreed, stating that "While LTE is currently the favored standard, it may be supplanted in the future. An LTE mandate would hamstring innovation and development and be contrary to the Commission's policy to preserve technical flexibility and refrain from imposing technical standards."³¹⁸

105. We agree with T-Mobile that locking licensees into a particular technology indefinitely is not warranted. Mandating a particular industry standard such as LTE would hamstring innovation and development and be contrary to the Commission's policy to preserve technical flexibility and refrain from imposing unnecessary technical standards. Instead, we seek to adopt those minimum requirements necessary to protect against interference or effectuate other compelling public interest objectives. As discussed above, the LTE standard was used to determine Protection Zones for the 1695-1710 MHz band,

³⁰⁹ *AWS-3 NPRM*, 28 FCC Rcd at 11524 ¶ 112.

³¹⁰ *See supra* ¶¶ 64-69.

³¹¹ *AWS-3 NPRM*, 28 FCC Rcd at 11517 ¶ 85.

³¹² *Id.* at 11520 ¶ 99.

³¹³ *See, e.g., id.* at ¶¶ 102-103.

³¹⁴ *See supra* para. 5 (Spectrum Act requires Commission to license spectrum under flexible use service rules for commercial use).

³¹⁵ The Commission also observed that similar commercial mobile services such as PCS, AWS-1, and the 700 MHz band deploy handsets using a variety of technologies, including CDMA and UMTS, as well as LTE. *AWS-3 NPRM*, 28 FCC Rcd at 11521 ¶102.

³¹⁶ AIA Comments at 3 (emphasis omitted).

³¹⁷ Raytheon Comments at 20 (emphasis in original). *See supra* 88-89.

³¹⁸ T-Mobile Reply Comments at 20-21 (footnote omitted).

but that does not require its adoption for all purposes.³¹⁹ Where the rules that we adopt today differ from proposed rules that reflected CSMAC's assumptions, we also adopt corresponding changes to the coordination zones. If in the future a licensee decides to use a technology other than LTE, the licensee will still be subject to our technical rules. If the technology complies with our rules but nonetheless poses a greater risk of interference to incumbent Federal operations, this development can be addressed as part of the required coordination process. Accordingly, we see no reason to mandate use of LTE in the AWS-3 bands.

9. Canadian and Mexican Coordination

106. In the *AWS-3 NPRM*, the Commission observed that section 27.57(c) of the rules³²⁰ provides that AWS-1 and AWS-4 operations are subject to international agreements with Mexico and Canada, and proposed to apply the same limitation to the AWS-3 bands.³²¹ No comments were submitted on this proposal. In order to ensure efficient use of the spectrum and interference-free operations in the border areas near Canada and Mexico, the Commission routinely works with the United States Department of State and Canadian and Mexican government officials. Until such time as any adjusted agreements, as needed, between the United States, Mexico and/or Canada can be agreed to, AWS-3 operations must not cause harmful interference across the border, consistent with the terms of the agreements currently in force.³²² We note that further modifications of the rules might be necessary in order to comply with any future agreements with Canada and Mexico regarding the use of these bands.

10. Other Technical Issues

107. In addition to the specific technical issues addressed above, the Commission also noted several rules that apply to Part 27 services generally, and proposed applying them to the AWS-3 bands as well.³²³ Specifically, the Commission proposed applying the following rule sections: 27.51 Equipment authorization, 27.52 RF safety, 27.54 Frequency stability, 27.56 Antennas structures; air navigation safety, and 27.63 Disturbance of AM broadcast station antenna patterns.³²⁴ The Commission reasoned that because AWS-3 will be a Part 27 service, these rules should apply to all AWS-3 licensees, including those who acquire licenses through partitioning or disaggregation.³²⁵ No commenters opposed this proposal. Accordingly, because these rules generally apply to all Part 27 services, and because, as we explain below, we find it appropriate to license the AWS-3 spectrum under our Part 27 regulatory framework,³²⁶ we conclude that the potential benefits of our proposal would outweigh any potential costs and adopt the proposal to apply these additional Part 27 rules to AWS-3 licensees.³²⁷

C. Licensing and Operating Rules; Regulatory Issues

108. The licensing and operating rules we adopt below provide AWS-3 licensees with the

³¹⁹ See *supra* ¶¶ 83-89. For the 1755-1780 MHz band, the coordination requirement applies nationwide, and not just to designated Protection Zones. See *infra* ¶¶ 220-222.

³²⁰ 47 C.F.R. § 27.57(c).

³²¹ *AWS-3 NPRM*, 28 FCC Rcd at 11523 ¶ 110.

³²² The list of agreements includes the "Protocol Concerning the Transmission and Reception of Signals from Satellites for the Provisions of Mobile-Satellite Services and Associated Feeder links in the United States of America and the United Mexican States."

³²³ *AWS-3 NPRM*, 28 FCC Rcd at 11523-24 ¶ 111.

³²⁴ *Id.*; 47 C.F.R. §§ 27.51, 27.52, 27.54, 27.56, 27.63.

³²⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11524 ¶ 111.

³²⁶ See *infra* Section III.C.3 (Regulatory Framework).

³²⁷ The Commission recently deleted Section 27.63. Rules governing disturbance of AM broadcast station antenna patterns are now contained in Subpart BB of Part 1, 47 C.F.R. §§ 1.30000-1.30004.

flexibility to provide any fixed or mobile service that is consistent with the allocations for this spectrum. In the *AWS-3 NPRM*, the Commission sought comment on the appropriate license term, criteria for renewal, and other licensing and operating rules pertaining to the AWS-3 band.³²⁸ In addition, the Commission sought comment on the potential impact of all of our proposals on competition.³²⁹ Herein, we adopt a set of service rules that set forth the license term, performance requirements, and license renewal criteria and establish secondary market transaction and permanent discontinuance rules for all AWS-3 wireless licenses. We also affirm that other rule parts that pertain generally to wireless communication services will similarly apply to AWS-3 licensees.

1. Assignment of Licenses

109. *Background.* The Spectrum Act states that the Commission shall grant new initial licenses for the 1695-1710 MHz and 2155-2180 MHz bands, and 15 additional megahertz of contiguous spectrum to be identified by the Commission, through a system of competitive bidding pursuant to section 309(j) of the Communications Act.³³⁰ In the *AWS-3 NPRM*, the Commission proposed for all AWS-3 bands, including 1755-1780 MHz and 2020-2025 MHz, to license on a geographic area basis, which would permit the acceptance of mutually exclusive applications. As such, the Commission proposed to resolve all AWS-3 applications and assign licenses through competitive bidding consistent with our statutory mandate.³³¹

110. *Discussion.* We adopt the Commission's proposal to assign initial licenses for the AWS-3 bands through a system of competitive bidding. Further, we adopt the Commission's proposal to license AWS-3 spectrum bands on a geographic area basis and permit the acceptance of mutually exclusive applications. AT&T, for example, agrees that the "initial assignments, in accordance with Congress' mandate, should be through a system of competitive bidding."³³² Thus, as detailed below, we adopt rules to govern the use of a competitive bidding process for licensing all AWS-3 bands, including 1755-1780 MHz and 2020-2025 MHz.

2. Flexible Use

111. *Background.* In the *AWS-3 NPRM*, consistent with the Spectrum Act's mandate to license according to flexible use service rules,³³³ the Commission proposed and sought comment on service rules that permit a licensee to employ the spectrum for any non-Federal use permitted by the United States Table of Frequency Allocations,³³⁴ subject to the Commission's Part 27 flexible use and other applicable rules (including service rules to avoid harmful interference).³³⁵ Thus, the Commission proposed that the spectrum may be used for any fixed or mobile service that is consistent with the

³²⁸ *AWS-3 NPRM*, 28 FCC Rcd at 11524-11536 ¶¶ 113-145.

³²⁹ *See generally*, *AWS-3 NPRM*, 28 FCC Rcd at 11524-11536 ¶¶ 113-145.

³³⁰ Spectrum Act, § 6401(b). The Commission is required to establish by regulation a competitive bidding methodology in accordance with section 309(j)'s statutory requirements when assigning licenses through auction. *See* 47 U.S.C. § 309(j)(3), (4).

³³¹ 47 U.S.C. §§ 309(j).

³³² AT&T Comments at 13. *See also*, Verizon Comments at 16.

³³³ Spectrum Act, § 6401(b)(1)(b).

³³⁴ 47 C.F.R. § 2.106. In section III.D (Allocation Matters) *infra*, we propose amendments to the Table of Frequency Allocations and tentatively conclude that these allocation proposals, together with our proposed service rules, satisfy 47 U.S.C. § 303(y).

³³⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11524-11525 ¶ 115. Part 27 licensees must also comply with other Commission rules of general applicability. *See* 47 C.F.R. § 27.3. In addition, flexible use in international border areas is subject to any existing or future international agreements. *See supra* section III.B.9 (Canadian and Mexican Coordination).

allocations for the band.³³⁶ The Commission sought comment on whether any restrictions are warranted and how such restrictions would comport with the statutory mandates of section 6401 of the Spectrum Act.³³⁷

112. *Discussion.* In accordance with the Spectrum Act's direction to license according to flexible use service rules,³³⁸ we will license the AWS-3 spectrum under Part 27. We received no comments on this specific proposal but found general support in the record for permitting flexible use.³³⁹ The Part 27 rules provide a broad and flexible regulatory framework for licensing spectrum, enabling the spectrum to be used for a wide variety of broadband services, thereby promoting innovation and efficient use of the spectrum.

3. Regulatory Framework

113. *Background.* In the *AWS-3 NPRM*, we proposed licensing AWS-3 spectrum in accordance with the flexible regulatory framework of Part 27 of our rules.³⁴⁰ We sought comment on our proposal to license the AWS-3 band under Part 27's service and licensing rules, and any associated costs or benefits of doing so.³⁴¹ We believe that our Part 27 rules are consistent with the Spectrum Act's requirement for "flexible-use service rules."

114. *Discussion.* We adopt the Commission's proposal to license AWS-3 spectrum in accordance with the flexible regulatory framework of Part 27 of our rules. We received no comments on this issue. We note that unlike other rule parts applicable to specific services, Part 27 does not prescribe a comprehensive set of licensing and operating rules for the spectrum to which it applies. Rather, for each frequency band under its umbrella, Part 27 defines permissible uses and any limitations thereon, and specifies basic licensing requirements.

4. Regulatory Status

115. *Background.* In the *AWS-3 NPRM*, the Commission proposed to apply the regulatory status provisions of Section 27.10 of the Commission's Rules to licensees in the AWS-3 band.³⁴² Specifically, Section 27.10 requires license applicants to identify the regulatory status of the services they intend to provide, and permits applicants and licensees to request common carrier status, non-common carrier status, private internal communications status, or a combination of these options, for authorization in a single license (or to switch between them).³⁴³ The Commission also proposed that if a licensee changes the service or services it offers such that its regulatory status would change, it must notify the Commission within 30 days of the change.³⁴⁴

116. *Discussion.* We adopt the proposal to apply Section 27.10 of our rules to AWS-3 licensees. Under this flexible regulatory approach, AWS-3 licensees may provide common carrier, non-common carrier, private internal communications or any combination of these services, so long as the

³³⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11524-11525 ¶ 115.

³³⁷ *AWS-3 NPRM*, 28 FCC Rcd at 11524-11525 ¶ 115.

³³⁸ Spectrum Act, § 6401(b)(1)(b).

³³⁹ See, e.g., TIA Comments at 14; Verizon Comments at 4.

³⁴⁰ *AWS-3 NPRM*, 28 FCC Rcd at 11525 ¶ 116. Part 27 licensees must also comply with other Commission rules of general applicability. See 47 C.F.R. § 27.3.

³⁴¹ *AWS-3 NPRM*, 28 FCC Rcd at 11525 ¶ 116.

³⁴² *Id.* at 11525 ¶ 117.

³⁴³ See 47 C.F.R. § 27.10; Amendment of the Commission's Rules to Establish Part 27, The Wireless Communications Service (WCS), 12 FCC Rcd 10785, 10846-48, ¶¶ 119-122 (1997) (*Part 27 Report and Order*).

³⁴⁴ *AWS-3 NPRM*, 28 FCC Rcd at 11526 ¶ 119.

provision of service otherwise complies with applicable service rules. We find that this broad licensing framework is likely to achieve efficiencies in the licensing and administrative process and will provide flexibility to the marketplace, thus encouraging licensees to develop new and innovative services. Moreover, by applying this requirement to AWS-3 licensees, we will treat them the same as other Part 27 licensees, all of whom are subject to this rule. Although no commenters directly address this issue, commenters do support increased regulatory flexibility generally.³⁴⁵ We conclude that this approach is in the public interest and that its benefits likely outweigh any potential costs.

117. We remind potential applicants that an election to provide service on a common carrier basis requires that the elements of common carriage be present;³⁴⁶ otherwise the applicant must choose non-common carrier status.³⁴⁷ If a potential licensee is unsure of the nature of its services and whether classification as common carrier is appropriate, it may submit a petition with its application, or at any time, requesting clarification and including service descriptions for that purpose.³⁴⁸

118. Consistent with the Commission's proposal in the *AWS-3 NPRM*,³⁴⁹ we extend to the AWS-3 band our Part 27 requirement that if a licensee elects to change the service or services it offers such that its regulatory status would change; it must notify the Commission and must do so within 30 days of making the change.³⁵⁰ A change in the licensee's regulatory status will not require prior Commission authorization, provided the licensee is in compliance with the foreign ownership requirements of Section 310(b) of the Communications Act that apply as a result of the change.³⁵¹ We note, however, that a different time period (other than 30 days) may apply, as determined by the Commission, where the change results in the discontinuance, reduction, or impairment of the existing service.³⁵²

5. Foreign Ownership Reporting

119. *Background.* In the *AWS-3 NPRM*, the Commission observed that Sections 310(a) and 310(b) of the Communications Act impose foreign ownership and citizenship requirements that restrict the issuance of licenses to certain applicants.³⁵³ The Commission proposed to apply Section 27.12 of the Commission's rules, which implements Section 310, to applicants for AWS-3 licenses.³⁵⁴ With respect to filing applications, the Commission proposed that all applicants provide the same foreign ownership information, which covers both Sections 310(a) and 310(b), regardless of whether they propose to provide

³⁴⁵ See, e.g., Verizon Comments at 4.

³⁴⁶ See 47 U.S.C. § 153(44) ("A telecommunications carrier shall be treated as a common carrier under this Act"); see also 47 U.S.C. § 332(C)(1)(A) ("A person engaged in the provision of a service that is a commercial mobile service shall, insofar as such person is so engaged, be treated as a common carrier for purposes of this Act").

³⁴⁷ See *Part 27 Report and Order*, 12 FCC Rcd at 10848, paras. 121-22.

³⁴⁸ *Id.* at 10848, para. 121.

³⁴⁹ *AWS-3 NPRM*, 28 FCC Rcd 11479, 11526, para. 119.

³⁵⁰ See 47 C.F.R. § 27.10(d). See also 47 C.F.R. § 27.66 (directing a licensee to notify the Commission if it elects to change its services such that its regulatory status would change).

³⁵¹ 47 U.S.C. § 310(b); see *infra* Licensing and Operating Rules; Regulatory Issues section (Foreign Ownership Reporting).

³⁵² See *id.* § 27.66.

³⁵³ *AWS-3 NPRM*, 28 FCC Rcd at 11527 ¶ 120.

³⁵⁴ *Id.* at 11526 ¶ 119.

common carrier or non-common carrier service in the band.³⁵⁵ The Commission sought comment on this proposal, including the associated costs and benefits.³⁵⁶

120. *Discussion.* In order to fulfill our statutory obligations under Section 310 of the Communications Act, we determine that all AWS-3 applicants and licensees shall be subject to the provisions of Section 27.12 of the Commission's rules.³⁵⁷ All such entities are subject to Section 310(a), which prohibits licenses from being "granted to or held by any foreign government or the representative thereof."³⁵⁸ In addition, any applicant or licensee that would provide a common carrier, aeronautical en route, or aeronautical fixed service would also be subject to the foreign ownership and citizenship requirements of Section 310(b).³⁵⁹

121. No commenters opposed (or commented on) the Commission's proposal to require all AWS-3 applicants and licensees to provide the same foreign ownership information in their filings, regardless of the type of service the licensee would provide using its authorization. We believe that applicants for this band should not be subject to different obligations in reporting their foreign ownership based on the type of service authorization requested in the application and that the benefits of a uniform approach outweigh any potential costs. Therefore, we will require all AWS-3 applicants and licensees to provide the same foreign ownership information, which covers both Sections 310(a) and 310(b), regardless of which service they propose to provide in the band. We expect, however, that we would be unlikely to deny a license to an applicant requesting to provide services exclusively that are not subject to Section 310(b), solely because its foreign ownership would disqualify it from receiving a license if the applicant had applied for authority to provide Section 310(b) services. However, if any such licensee later desires to provide any services that are subject to the restrictions in Section 310(b), we would require that licensee to apply to the Commission for an amended license, and we would consider issues related to foreign ownership at that time.

6. Eligibility

122. *Background.* In the *AWS-3 NPRM*, the Commission proposed to adopt an open eligibility standard for the AWS-3 band.³⁶⁰ The Commission explained that opening the AWS-3 band to as wide a range of licensees as possible would encourage efforts to develop new technologies, products, and services, while helping to ensure efficient use of this spectrum.³⁶¹

123. The Commission also explained that section 6004 of the Spectrum Act restricts participation in auctions required under the Spectrum Act by "person[s] who [have] been, for reasons of national security, barred by any agency of the Federal Government from bidding on a contract, participating in an auction, or receiving a grant."³⁶² The Commission noted that, in the *Incentive Auctions*

³⁵⁵ *Id.* at 11527 ¶ 120.

³⁵⁶ *Id.* at 11527 ¶ 120.

³⁵⁷ 47 C.F.R. § 27.12; *see also* Review of Foreign Ownership Policies for Common Carrier and Aeronautical Radio Licensees under Section 310(b)(4) of the Communications Act of 1934, as amended, IB Docket No. 11-133, *Second Report and Order*, 28 FCC Rcd 5741, App. B (2013) (adopting 47 C.F.R. §§ 1.990-1.994, which establish the requirements and conditions for obtaining the Commission's prior approval of foreign ownership in common carrier, aeronautical en route, and aeronautical fixed radio station licensees and common carrier spectrum lessees).

³⁵⁸ 47 U.S.C. § 310(a).

³⁵⁹ *Id.* § 310(b).

³⁶⁰ *AWS-3 NPRM*, 28 FCC Rcd at 11527 ¶ 121.

³⁶¹ *Id.* at 11527 ¶ 121.

³⁶² *See AWS-3 NPRM*, 28 FCC Rcd at 11527 ¶ 121 quoting Spectrum Act, § 6004; 47 U.S.C. § 1404. We address in Section III.C.11.d (Commercial Spectrum Enhancement Act Requirements) below the application of Section 6004 to the conduct of the AWS-3 auction.

NPRM and in the *H Block NPRM*, it had sought comment on whether section 6004 permits or requires the Commission to restrict eligibility of persons acquiring licenses on the secondary market, whether and to what extent such a restriction is consistent with other provisions of the Communications Act, and what procedures and rules, if any, should apply to persons acquiring licenses on the secondary market.³⁶³ In the *H Block R&O*, the Commission adopted an eligibility rule providing that “[a] person described in 47 U.S.C. § 1404(c) is ineligible to hold a license that is required by 47 U.S.C. Chapter 13 (Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 125 Stat. 156 (2012)) to be assigned by a system of competitive bidding under Section 309(j) of the Communications Act, 47 U.S.C. § 309(j).”³⁶⁴ The Commission noted that this revised restriction will govern most of the AWS-3 spectrum³⁶⁵ and that, until appropriate application forms are revised, applicants for spectrum subject to Section 6004 will be required to include a certification as an attachment to the application and for applicants that are not individuals, the same attribution standards that were adopted for short-form applications will apply.³⁶⁶ One commenter, Mobile Future, addressed the larger issue of the open eligibility proposal by commenting that it supports such an approach.³⁶⁷

124. *Discussion.* We find that nothing in the record demonstrates that we should adopt restrictions on open eligibility. Therefore, we find that open eligibility for the AWS-3 band is consistent with our statutory mandate to promote the development and rapid deployment of new technologies, products, and services; economic opportunity and competition; and the efficient and intensive use of the electromagnetic spectrum.³⁶⁸ We conclude, based on the record before us,³⁶⁹ that the potential benefits of open eligibility for the AWS-3 band outweigh any potential costs.

125. Section 27.12(b) of the Commission’s rules provides that “[a] person described in 47 U.S.C. § 1404(c) is ineligible to hold a license that is required by 47 U.S.C. Chapter 13 (Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 125 Stat. 156 (2012)) to be assigned by a system of competitive bidding under Section 309(j) of the Communications Act, 47 U.S.C. § 309(j).”³⁷⁰ We conclude that this provision governs the 1695-1710 MHz band, the 1755-1780 MHz band and the 2155-2180 MHz band as explained in the *AWS-3 NPRM*. Because we are pairing 1755-1780 MHz (15 megahertz of which we have identified as the “additional fifteen megahertz of contiguous spectrum” under the Spectrum Act) with 2155-2180 MHz (all of which is subject to the Spectrum Act), we will treat all 50 megahertz as subject to the statutory restriction.

³⁶³ *Id.* at 11527 ¶ 121 citing *H Block NPRM*, 27 FCC Rcd at 16286 ¶¶ 74-75. The Commission noted that section 6004 does not address eligibility to acquire licenses through transfers, assignments, or other secondary market mechanisms from the initial or subsequent licensee. *See, e.g., Incentive Auctions NPRM*, 27 FCC Rcd at 12483-84 ¶ 382 (citing Spectrum Act at § 6004(c)).

³⁶⁴ *AWS-3 NPRM*, 28 FCC Rcd at 11527 ¶ 121 n.285 citing *H Block R&O* at App. A; *see also* 47 C.F.R. § 27.12(b). In the *H Block R&O*, the Commission also adopted an amendment to its rules to implement Section 6004 by adding a national security certification to the application to participate in competitive bidding. *See* 47 C.F.R. § 1.2105(a)(2)(xii).

³⁶⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11527 ¶ 121.

³⁶⁶ *Id.* at 11527 ¶ 121 n.286 citing *H Block R&O* at ¶ 187.

³⁶⁷ *See* Mobile Future Comments at 14 (arguing that the FCC should adopt an open eligibility standard for the AWS-3 auction and that an open eligibility standard is consistent with the Spectrum Act).

³⁶⁸ *See* 47 U.S.C. § 309(j)(3)(A), (B), & (D). We note, however, that applicants for AWS-3 licenses must comply with any licensing qualifications required by statute or rule.

³⁶⁹ *See* AT&T Comments at 13 (arguing in favor of applying the eligibility policies in Part 27 of the Commission’s rules).

³⁷⁰ 47 C.F.R. § 27.12(b).

7. Mobile Spectrum Holding Policies

126. Spectrum is an essential input for the provision of mobile wireless services, and ensuring access to and the availability of sufficient spectrum is crucial to promoting the competition that drives innovation and investment.³⁷¹ Section 309(j)(3)(B) of the Communications Act provides that, in designing systems of competitive bidding, the Commission shall “promot[e] economic opportunity and competition and ensur[e] that new and innovative technologies are readily accessible to the American people by avoiding excessive concentration of licenses.”³⁷² Section 6404 of the Spectrum Act amends Section 309(j) to bar the Commission from “prevent[ing] a person from participating in a system of competitive bidding” thereunder if such person satisfies specified qualifications criteria. However, that provision does not affect any authority the Commission has “to adopt and enforce rules of general applicability, including rules concerning spectrum aggregation that promote competition.”³⁷³ In September 2012, the Commission initiated a proceeding to review the mobile spectrum holdings policies that currently apply to both secondary market transactions and competitive bidding.³⁷⁴ The Commission indicated that, during the pendency of this proceeding, the Commission will continue to apply its current case-by-case approach to evaluate mobile spectrum holdings during its consideration of secondary market transactions and initial spectrum licensing after auctions.³⁷⁵

127. In the *AWS-3 NPRM*, the Commission sought comment on whether and how to address mobile spectrum holding issues to meet our statutory requirements pursuant to Section 309(j)(3)(B) and Section 6404 of the Spectrum Act and our goals for the AWS-3 band.³⁷⁶ The Commission also asked whether the acquisition of each of the AWS-3 spectrum bands should be subject to the same general mobile spectrum holding policies applicable to frequency bands that the Commission has found to be suitable and available for the provision of mobile telephony/broadband services. Alternatively, it sought comment on whether there were any reasons to distinguish AWS-3 spectrum for purposes of evaluating mobile spectrum holdings.³⁷⁷ It asked commenters to discuss and quantify any costs and benefits associated with any proposals.³⁷⁸

128. USCC supports adopting a 25 percent limit on the amount of AWS-3 spectrum any one auction participant may acquire in a single market to promote competition and diversity of license holders in the band, which USCC asserts would encourage interoperability and roaming opportunities.³⁷⁹ Mobile Future and Verizon Wireless oppose any auction-specific limits for the AWS-3 band.³⁸⁰ In particular, Verizon Wireless opposes USCC’s proposal, claiming that USCC’s proposed spectrum limit is unnecessary to prevent a lack of interoperability.³⁸¹ CCA, RWA, Mobile Future, T-Mobile, Sprint, and

³⁷¹ See generally *Sixteenth Mobile Wireless Competition Report*, 28 FCC Rcd 3700.

³⁷² 47 U.S.C. § 309(j)(3)(B).

³⁷³ Spectrum Act, § 6404, 47 U.S.C. § 1404.

³⁷⁴ See Policies Regarding Mobile Spectrum Holdings, WT Docket No. 12-269, *Notice of Proposed Rulemaking*, 27 FCC Rcd 11710 (2012) (*Mobile Spectrum Holdings NPRM*).

³⁷⁵ See *Mobile Spectrum Holdings NPRM*, 27 FCC Rcd at 11718 n.59.

³⁷⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11528 ¶ 122.

³⁷⁷ *Id.* at 11528 ¶ 123.

³⁷⁸ *Id.* at 11528 ¶ 123.

³⁷⁹ USCC Comments at 52.

³⁸⁰ Mobile Future Comments at 14; Verizon Wireless Reply at 6-7.

³⁸¹ Verizon Wireless Reply at 6-7.

Verizon Wireless encourage the Commission to conclude its *Mobile Spectrum Holdings* rulemaking prior to making a determination on mobile spectrum holdings policies with regard to the AWS-3 bands.³⁸²

129. We observe that parties commenting on spectrum holdings issues in the AWS-3 rulemaking have raised issues with broader applicability to the *Mobile Spectrum Holdings* rulemaking, in addition to issues that relate to the characteristics of the AWS-3 bands. Given that we anticipate taking action in the *Mobile Spectrum Holdings* rulemaking well in advance of the AWS-3 auction, we find that rulemaking to be the most appropriate context in which to resolve whether any mobile spectrum holdings policies should apply to the upcoming AWS-3 auction and whether the AWS-3 bands should be included in the input market for spectrum used in the Commission's competitive review of transactions.

8. License Term, Performance Requirements, Renewal Criteria, Permanent Discontinuance of Operations

a. License Term

130. *Background.* In the *AWS-3 NPRM*, the Commission proposed to establish a 10-year term for licenses for the AWS-3 band.³⁸³ The Commission noted that the Communications Act does not specify a term limit for AWS band licenses³⁸⁴ and that it has adopted 10-year license terms for most wireless radio services licenses.³⁸⁵ To maintain this consistency among wireless services, in the *H Block R&O* and the *AWS-4 Service Rules R&O*, the Commission adopted 10-year license terms.³⁸⁶ In addition, the Commission proposed that, if an AWS-3 license is partitioned or disaggregated,³⁸⁷ any partitionee or disaggregatee would be authorized to hold its license for the remainder of the partitioner's or disaggregator's original license term.³⁸⁸ The Commission sought comment on these proposals, including the associated costs and benefits.³⁸⁹

131. *Discussion.* We adopt an initial license term for AWS-3 spectrum rights of 12 years and subsequent renewal terms of 10 years and we modify Section 27.13 of the Commission's rules to reflect these determinations. The Communications Act does not require a specific term for non-broadcast spectrum licenses.³⁹⁰ The Commission has typically adopted 10-year license terms for Part 27 services,³⁹¹

³⁸² See CCA Comments at 10; Mobile Future Comments at 14; T-Mobile Reply at 26; Sprint Reply at 3-4; RWA Reply at 8-1; Verizon Wireless Comments at 13.

³⁸³ *AWS-3 NPRM*, 28 FCC Rcd at 11528 ¶ 124.

³⁸⁴ The only statutory limit on license terms is 8 years for licenses in the broadcast services. See 47 U.S.C. § 307(c)(1); see also 47 C.F.R. § 73.1020(a).

³⁸⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11528 ¶ 129 n.292 citing, e.g., 47 C.F.R. §§ 24.15, 27.13(a).

³⁸⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11528 ¶ 129 n.293 citing *H Block R&O*, ¶ 193; *AWS-4 Service Rules R&O*, 27 FCC Rcd at 16200 ¶ 262.

³⁸⁷ "Partitioning" is the assignment of geographic portions of a license along geopolitical or other boundaries. "Disaggregation" is the assignment of discrete portions of "blocks" of spectrum licensed to a geographic licensee or qualifying entity. Disaggregation allows for multiple transmitters in the same geographic area operated by different companies on adjacent frequencies (thus increasing the possibility of harmful interference).

³⁸⁸ *AWS-3 NPRM*, 28 FCC Rcd at 11529 ¶ 125.

³⁸⁹ *Id.* at 11528 ¶ 124.

³⁹⁰ The only statutory limit on license terms is 8 years for licenses in the broadcast services. See 47 U.S.C. § 307(c)(1); see also 47 C.F.R. § 73.1020(a).

³⁹¹ See 47 C.F.R. § 27.13, describing initial license terms for licensees in the 2305-2320 MHz and 2345-2360 MHz bands (not to exceed 10 years), 698-758 MHz and 776-788 MHz bands (generally not to exceed 10 years), 1390-1392 MHz band (not to exceed 10 years), 1392-1395 MHz and 1432-1435 MHz bands (not to exceed 10 years), 1670-1675 MHz band (not to exceed 10 years), 2200-2020 MHz and 2180-2200 MHz Bands (not to exceed 10 years); see also 47 C.F.R. § 24.15, describing initial license terms for PCS licensees (10 years); but see *AWS-1*

(continued....)

but has also found, as in the case of AWS-1 licenses, a longer initial term to be in the public interest.³⁹² We find that this approach is in the public interest and find that its benefits outweigh any potential costs. Further, commenters generally support at least a 10-year license term.³⁹³ Given the complexities and timing of clearing government operations in the AWS-3 bands, we agree with AT&T and USCC that a longer initial license term is appropriate.³⁹⁴

132. We decline, however, to adopt proposals by AT&T and USCC that the Commission consider 15-year initial license term.³⁹⁵ We believe instead that a 12-year initial term adequately compensates for the transition of government operations,³⁹⁶ and a 15-year initial term would be unnecessarily long. Nevertheless, we direct the Wireless Telecommunications Bureau to solicit comment in the third year following the initial licensing of AWS-3 spectrum for the purpose of making a recommendation to the Commission about whether an extension of the initial license term (and associated build-out deadlines) by up to 3 years is warranted in light of the status of government relocation. We agree with AT&T that the initial license term should match any adjustments extending the final build-out benchmarks.³⁹⁷

133. We adopt the Commission's proposal that, if an AWS-3 license is partitioned or disaggregated, any partitionee or disaggregatee would be authorized to hold its license for the remainder of the partitioner's or disaggregator's original license term. No commenter addressed this proposal. We note, however, that this approach is similar to the partitioning and disaggregation provisions that the Commission adopted for BRS,³⁹⁸ for broadband PCS,³⁹⁹ for the 700 MHz band,⁴⁰⁰ and for AWS-1 licenses at 1710-1755 MHz and 2110-2155 MHz,⁴⁰¹ and AWS-4.⁴⁰² We emphasize that nothing in our action is intended to enable a licensee, by partitioning or disaggregating the license, to confer greater rights than it

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Report and Order, 18 FCC Rcd at 25190 ¶ 70 (15 year initial term for licenses issued before 2010, thereafter, not to exceed 10 years).

³⁹² See, e.g., *AWS-1 Report and Order*, 18 FCC Rcd at 25190 ¶ 70 (finding issues related to the relocation of Federal operations warranted an initial license term of 15 years).

³⁹³ See AT&T Comments at 15; Verizon Comments at 20; AT&T Reply Comments at 5-6; T-Mobile Comments at 32.

³⁹⁴ AT&T Comments at 15; USCC Comments at 54-55.

³⁹⁵ AT&T Comments at 15; USCC Comments at 54-55.

³⁹⁶ Further, wireless licensees receive their licenses not at auction completion, but after a period of time following the close of the auction to allow for license applications to be filed, processed, and reviewed to ensure the applicant meets the applicable qualifications to hold a wireless license.

³⁹⁷ AT&T Comments at 15. See also, T-Mobile Comments at 32 (requesting that the Commission remain open to case-by-case relief if ongoing government spectrum use impedes build-out longer than anticipated).

³⁹⁸ See Amendment of Parts 21 and 74 of the Commission's Rules With Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service, MM Docket No. 94-131, PP Docket No. 93-253, *Report and Order*, 10 FCC Rcd 9589, 9614 ¶ 46 (1995).

³⁹⁹ See Geographic Partitioning and Spectrum Disaggregation by Commercial Mobile Radio Services Licensees, WT Docket No. 96-148, GN Docket No. 96-113, *Report and Order and Further Notice of Proposed Rulemaking*, 11 FCC Rcd 21831, 21870 ¶¶ 76-77 (1996).

⁴⁰⁰ See Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, WT Docket No. 99-168, *First Report and Order*, 15 FCC Rcd 476, 506-08 ¶¶ 74-78 (2000); Reallocation and Service Rules for 698-746 MHz Spectrum Band (Television Channels 52-59), GN Docket No. 01-74, *Report and Order*, 17 FCC Rcd 1022, 1079-81 ¶¶ 152-157 (2002).

⁴⁰¹ *AWS-1 Report and Order*, 18 FCC Rcd at 25193-95 ¶¶ 81-83.

⁴⁰² *AWS-4 Service Rules R&O*, 27 FCC Rcd at 16200 ¶ 263.

was awarded under the terms of its license grant. Similarly, nothing in this action is intended to enable any partitionee or disaggregatee to obtain rights in excess of those previously possessed by the underlying licensee.

b. Performance Requirements

134. *Background.* In the *AWS-3 NPRM*, the Commission proposed to adopt specific, quantifiable performance requirements for AWS-3 licensees to ensure that licensees begin providing service to consumers in a timely manner.⁴⁰³ In the *AWS-3 NPRM*, the Commission proposed to measure build-out progress using a population-based benchmark within each license area, and sought comment on whether it should adopt an interim benchmark, an end-of-term benchmark, or other requirements.⁴⁰⁴ In addition, in the *AWS-3 NPRM*, the Commission sought comment on appropriate performance benchmarks for any AWS-3 uplink spectrum paired with downlink spectrum in a band other than AWS-3 and for areas where Federal use limits or prohibits AWS-3 use.⁴⁰⁵ Further, the Commission sought comment on whether performance requirements are necessary for service areas within the Gulf of Mexico.⁴⁰⁶ Along with performance benchmarks, the Commission noted that there must be meaningful and enforceable consequences, or penalties, for failing to meet construction requirements.⁴⁰⁷ Toward that end, the Commission also sought comment on a number of different penalties, seeking input on which set of incentives would most effectively ensure timely build-out in this band.⁴⁰⁸

135. *Discussion.* We establish performance requirements to promote the productive use of spectrum, to encourage licensees to provide service to customers in a timely manner, and to promote the provision of innovative services in unserved areas, particularly rural ones.⁴⁰⁹ Over the years, the Commission has tailored performance and construction requirements with an eye to the unique characteristics of individual frequency bands and the types of services expected, among other factors. Our goal is to ensure that timely and robust build-out occurs in these bands and, for the reasons discussed below, we believe that concrete interim and final build-out benchmarks will best facilitate meeting this goal. The performance requirements we establish for the AWS-3 band are consistent with those the Commission has adopted in recent items for other spectrum bands,⁴¹⁰ while taking into account certain exceptional circumstances related to the timing for the transition of this spectrum from government use to wireless use.⁴¹¹ These requirements will ensure that the AWS-3 spectrum is put to use expeditiously while providing licensees with flexibility to deploy services according to their business plans.⁴¹² Specifically, we require:

⁴⁰³ *AWS-3 NPRM*, 28 FCC Rcd at 11530 ¶ 127-129.

⁴⁰⁴ *Id.* at 11530 ¶¶ 127-129.

⁴⁰⁵ *Id.* at 11530 ¶ 129.

⁴⁰⁶ *Id.* at 11530 ¶ 129.

⁴⁰⁷ *Id.* at 11530-31 ¶¶ 130-131.

⁴⁰⁸ *Id.* at 11530-31 ¶¶ 130-131.

⁴⁰⁹ *See 700 MHz Second Report and Order*, 22 FCC Rcd at 15348 ¶ 154.

⁴¹⁰ *See, e.g., AWS-4 Service Rules Report and Order*, 27 FCC Rcd at 16173-74 ¶ 187; *H Block Report and Order*, 28 FCC Rcd at 9558 ¶ 195.

⁴¹¹ As noted below in the Partitioning and Disaggregation section, the performance requirements we adopt also apply to disaggregated spectrum or partitioned geographic service areas. *See infra* III.C.8.e(i) (Partitioning and Disaggregation). *See* 47 C.F.R. § 27.15(d) (addressing compliance with construction requirements).

⁴¹² *But see* USCC Comments at 61 (stating that uniform coverage standards are inherently arbitrary).

- *AWS-3 Interim Build-out Requirement:* Within six (6) years of an initial grant, licensee shall provide reliable signal coverage and offer service to at least forty (40) percent of the population in each of its license areas.
- *AWS-3 Final Build-out Requirement:* By the end of the initial license term, *i.e.*, within twelve (12) years, a licensee shall provide reliable signal coverage and offer service to at least seventy-five (75) percent of the population in each of its license areas.

136. Additionally, we adopt the following penalties for failing to meet the build-out benchmarks:

- *Failure to meet AWS-3 band interim build-out requirement:* In the event a licensee fails to meet the AWS-3 Interim Build-out Requirement in its license area, the final build-out requirement and initial license term shall be accelerated by 2 years (from 12 to 10).
- *Failure to meet AWS-3 band final build-out requirement:* In the event a licensee fails to meet the AWS-3 Final Build-out Requirement for any licensed area, the license for each licensed area in which it fails to meet the build-out requirement shall terminate automatically without Commission action.

137. Based on the record before us,⁴¹³ we find that these performance requirements are in the public interest and that the benefits of these requirements outweigh any potential costs. We explain below the rationale for these performance requirements, and the attendant penalties for failure to comply. We also discuss below how we will measure build-out in the Gulf of Mexico.

138. *Population-based benchmark, [per license area].* Supported by a number of comments in the record,⁴¹⁴ we adopt the proposal to use objective, population-based interim and final construction benchmarks, which will be measured per license area. Requiring AWS-3 licensees to meet these performance benchmarks will promote rapid deployment of new broadband services to the American public, and at the same time provide licensees with certainty regarding their construction obligations. We agree with Verizon that, for this spectrum band, measuring build-out by percentage of population served “will ensure that licensees provide wireless broadband services where customers actually will use them and need them.”⁴¹⁵ Further, Blooston Rural Carriers argues that population-based AWS-3 construction requirements are appropriate for CMA license areas.⁴¹⁶

139. We are not persuaded by arguments that our build-out requirements must be geography-based, or include a geographic component, in order to ensure that less densely populated, often rural,

⁴¹³ Verizon Comments at 21-22; Verizon Reply Comments at 2-3; AT&T Comments at 14; AT&T Reply Comments at 5-6; T-Mobile Comments at 32-33. *But see*, USCC Reply Comments at 57 (arguing for 30 percent coverage within 4 years or 35 percent coverage within 5 years). Blooston Rural Carriers states that the Commission’s proposed benchmarks may be appropriate if smaller CMA license areas are used, but they may result in large amounts of AWS-3 spectrum in rural areas remaining unused if the FCC licenses the AWS-3 spectrum on the basis of EAs. Blooston Rural Carriers Reply Comments at 6.

⁴¹⁴ Verizon Comments at 20-21; Verizon Reply at 2. AT&T and a number of other commenters generally support the Commission’s proposals regarding license term and performance requirements. *See, e.g.*, AT&T Comments at 14-15; T-Mobile Comments at 32-33; AT&T Reply Comments at 5, n.15.

⁴¹⁵ Verizon Comments at 22.

⁴¹⁶ Blooston Rural Carriers Reply Comments at 6 (arguing that the Commission’s proposed benchmarks may be appropriate if the Commission selects CMA-based licenses, but may result in large amounts of AWS-3 spectrum in rural areas remaining unused if the Commission licenses AWS-3 spectrum on the basis of EAs).

communities have timely access to the most advanced mobile broadband services.⁴¹⁷ We agree that it is important to promote rapid broadband deployment in rural areas. In fact, Section 309(j)(4)(B) of the Act requires that the Commission “include performance requirements, such as appropriate deadlines and penalties for performance failures, to ensure prompt delivery of service to rural areas.”⁴¹⁸ We find that adopting relatively small, CMA and EA-based license areas, and requiring licensees to meet challenging population-based benchmarks in each individual license area separately, strikes an appropriate balance between providing flexibility to AWS-3 band licensees to deploy their networks in a cost-effective manner and assertively promoting deployment of service to less densely populated areas. We note that nothing about our decision to require population-based benchmarks in this band would foreclose our ability to impose geographic-based benchmarks in other spectrum bands that may warrant different considerations.⁴¹⁹

140. Further, we reject Verizon’s request that we measure compliance with the interim benchmark in the aggregate, *i.e.*, by summing the population of all of a licensee’s authorizations for AWS-3 spectrum.⁴²⁰ Creating benchmarks on a per-license basis, rather than in the aggregate, is consistent with our build-out requirements in other, similar spectrum bands.⁴²¹ Further, this approach allows for more flexibility and certainty in licensing. In addition, measuring benchmarks on a per-license basis is consistent with our determination to license service on a geographic basis and hold a licensee accountable for meeting performance obligations for all of the licenses (including partitioned licenses) that it holds. For example, should a licensee partition some of its AWS-3 spectrum, a percentage-based approach would apply to each partitioned license. In contrast, it is not clear how the responsibility for meeting benchmarks for partitioned and disaggregated licenses would be handled under Verizon’s proposal.

141. *Areas unavailable due to Federal relocation and coordination requirements.* A number of commenters argue that the population of an area in which AWS-3 operations are prohibited to protect government operations should be excluded when determining whether a licensee has met its build-out requirements.⁴²² We find that this scenario is best addressed by the extended interim and final construction benchmarks because we believe that applying the same performance requirements to all AWS-3 licensees will help ensure that licensees build out their entire licensed service areas. We also generally agree that if a licensee demonstrates that it is unable to meet a coverage requirement due to circumstances beyond its control, an extension of the coverage period might be warranted.⁴²³

⁴¹⁷ RWA Comments at 3, 6-7 (arguing that geographic-based performance requirements rather than population-based requirements will prevent spectrum warehousing and promote build-out to rural and remote areas); RWA Reply Comments at 6; NTCH Reply at 2.

⁴¹⁸ 47 U.S.C. § 309(j)(4)(B).

⁴¹⁹ For example, we observe that the Commission established geographic-based performance requirements for the 700 MHz B Block in light of technical characteristics and the CMA geographic license area size specific to that band. *See 700 MHz Second Report and Order*, 22 FCC Rcd at 15349 ¶¶ 157-58 (adopting geographic-based benchmarks).

⁴²⁰ Verizon Comments at 21 (compliance measurements based on summing the population of all of a licensee’s authorizations in the AWS-3 band); Verizon *Ex Parte* dated Feb. 3, 2014 at 2.

⁴²¹ *See, e.g., H Block Report and Order*, 28 FCC Rcd at 9558 ¶ 195; *700 MHz Second Report and Order*, 22 FCC Rcd at 15348-49 ¶ 155.

⁴²² Verizon Reply Comments at 3; T-Mobile Comments at 32; USCC Comments at 67; Raytheon Comments at 38-39; Raytheon Reply Comments at 12-13.

⁴²³ *See* 47 C.F.R. § 1.946(e).

142. *Interim Benchmark.* We find that requiring an interim milestone is supported by the record,⁴²⁴ serves the public interest, and is similar to our approach in other, similar spectrum bands.⁴²⁵ A 40 percent build-out per license area benchmark is consistent with the interim benchmarks established in other bands⁴²⁶ and with various proposals suggested by commenters. For instance, Verizon proposes adopting a build-out requirement of 40 percent of the population within 4 years.⁴²⁷ Blooston Rural Carriers also supports the Commission’s proposed interim benchmark, but only if the Commission licenses the AWS-3 spectrum according to CMAs.⁴²⁸

143. Several commenters argue that the FCC should start the build-out period on a date certain that is after the final transition date for government operations.⁴²⁹ We decline to do so. Instead, we set the interim build-out benchmark 6 years from the grant of the license, which should adequately account for the period of time it will take for Federal users to relocate out of the bands being reallocated for commercial use. Further, setting a date certain that is tied to initial grant of the AWS-3 band license will provide greater certainty to AWS-3 band licensees, their investors, and other interested parties. This does not mean, however, that an AWS-3 band licensee must wait for the all Federal users to relocate; an AWS-3 licensee can begin operating in a specific license area after successful coordination and as soon as it is confirmed that the Federal users have fully relocated out of that particular license area based on their projected transition timelines.

144. We reject the proposal of commenters who advocate a “substantial service” standard as the only gauge of performance.⁴³⁰ Our purpose is to ensure that timely and robust build-out occurs in this band and for the reasons enumerated above, we believe that concrete interim and final build-out benchmarks best advance this goal. Further, we note that in recent Commission decisions, the Commission has replaced the substantial service standard with specific interim and final build-out requirements.⁴³¹

145. *Evaluation of reliable signal coverage and service offering for unpaired, uplink only licenses at 1695-1710 MHz.* As discussed above, the 1695-1710 MHz band is low-power, uplink-only spectrum and must be paired with base stations. For the Commission to determine whether the 1695-1710 MHz band licensee is meeting its performance benchmarks, the 1695-1710 MHz band licensee must pair this uplink spectrum with downlink spectrum. Once the licensee’s base stations are built or modified to control and receive 1695-1710 MHz uplinks,⁴³² the reliable signal coverage of such base stations (in

⁴²⁴ Verizon Comments at 21.

⁴²⁵ *But see*, USCC Comments at 64 (arguing that a strict coverage requirement, particularly one occurring in the midst of a license term would severely prejudice small and medium size carriers).

⁴²⁶ *See, e.g., AWS-4 Report and Order*, 27 FCC Rcd at 16174 ¶ 187; *700 MHz Second Report and Order*, 22 FCC Rcd at 15351 ¶ 162.

⁴²⁷ Verizon Comments at 21. *But see* USCC Reply Comments at 56-57 (arguing that the Commission should adopt a 6-year interim milestone).

⁴²⁸ Blooston Rural Carriers Comments at 6.

⁴²⁹ AT&T Comments at 14-15; AT&T Reply Comments at 6; AT&T *Ex Parte* dated March 20, 2014, at 1; Verizon Reply Comments at 3. *See also*, T-Mobile Comments at 33.

⁴³⁰ USCC Comments at 55-56 (arguing that the Commission should apply the “substantial service” construction standard to AWS-3 licenses, as it did for AWS-1 licensees); USCC Reply Comments at 50.

⁴³¹ *AWS-4 Service Rules Report and Order*, 27 FCC Rcd at 16173-74 ¶ 187; *H Block Report and Order*, 28 FCC Rcd at 9558 ¶ 195.

⁴³² Any base station to be built or modified that is located in a Protection Zone, *see infra* App. A, 47 C.F.R. § 2.106 footnote US 88, must be successfully coordinated with Federal incumbents prior to enabling/serving uplink devices that transmit in the 1695-1710 MHz.

bands paired with 1695-1710 MHz) will determine the percentage of the population served in the licensed area of the 1695-1710 MHz uplinks, assuming that the licensee is offering service that includes UE that transmits in the 1695-1710 MHz band. The 1695-1710 MHz licensee must show that it is complying with the build-out requirements applicable to all AWS-3 licensees, in addition to separately meeting the performance obligations for any spectrum bands paired with the 1695-1710 MHz spectrum.⁴³³

146. *Penalty for failure to meet the interim benchmark.* Commenters generally support the Commission's proposal to assess a penalty on licensees that fail to meet the interim construction benchmark.⁴³⁴ Therefore, like similar spectrum bands,⁴³⁵ we accelerate by 2 years the time frame to complete build-out and the length of the license term. Because the initial license term is 12 years,⁴³⁶ if a licensee fails to meet the interim benchmark, it must complete its final build-out requirement within 10 years, when its license term also expires.

147. *Final Benchmark.* Within 12 years of the initial grant (or 10 years if the interim benchmark is not met), a licensee shall provide reliable coverage and offer wireless service to at least 75 percent of the population in each of its license areas. Commenters generally support the Commission's approach.⁴³⁷ Establishing a final build-out benchmark that coincides with the end of the initial license term is consistent with how the Commission has formulated performance requirements in other spectrum bands.⁴³⁸ Because we have set the interim benchmark at 6 years and we have created a 12-year initial license term, we find Verizon's suggestion that we establish a 7-year final build-out requirement to be unduly accelerated and we therefore decline to adopt it.⁴³⁹ Under the circumstances, a 12-year construction milestone provides a reasonable timeframe for a licensee to deploy its network and offer widespread service, provided it meets its interim benchmark. Licensees that do not meet the 6-year interim benchmark must accelerate their final build out by 2 years to meet the final benchmark by the end of their shortened, 10-year license term.

148. *Penalty for failure to meet the final benchmark.* Where a licensee fails to meet the final build-out requirement in any EA or CMA, its authorization for each EA or CMA in which it fails to meet the requirement shall terminate automatically without further Commission action. Automatic termination is a common remedy for failure to build Part 27 flexible use licenses and is the approach adopted by the Commission in the *AWS-4 Report and Order* and the *H Block Report and Order*.⁴⁴⁰ By terminating only the specific licenses where a licensee fails to meet the final benchmark, we will not directly affect a licensee's customers in other license areas.⁴⁴¹ We decline to adopt "keep-what-you-use" as a penalty for

⁴³³ If the 1695-1700 MHz licensee fails to meet a benchmark, it will be subject to penalties discussed herein. However, failure to meet an AWS-3 band benchmark would not affect the downlink side of the pair, assuming that the licensee was complying with the performance obligations for that downlink spectrum.

⁴³⁴ See, e.g., USCC Comments at 59 (arguing that failure to meet the interim benchmark should accelerate final build-out by 1 year).

⁴³⁵ See, e.g., *700 MHz Second Report and Order*, 22 FCC Rcd at 15351 ¶ 163; *H Block Report and Order*, 28 FCC Rcd at 9558 ¶ 195.

⁴³⁶ See *supra* III.C.8.a (License Term)

⁴³⁷ T-Mobile Comments at 32; AT&T Reply Comments at 14; AT&T Comments at 5-6. *But see*, USCC Comments at 67 (arguing for a 66 percent coverage requirement due at 10 years).

⁴³⁸ See, e.g., *700 MHz Second Report and Order*, 22 FCC Rcd at 15293 ¶ 6; *H Block Report and Order*, 28 FCC Rcd at 9558 ¶ 195. *But see*, Verizon Comments at 20-21 (arguing for a 10-year license term with the final build-out requirement due at 7 years).

⁴³⁹ Verizon Comments at 21.

⁴⁴⁰ See, e.g., 47 C.F.R. § 27.14(g)(2) and 47 C.F.R. § 27.14(h)(2).

⁴⁴¹ See *AWS-4 Report and Order*, 27 FCC Rcd at 16180 ¶ 202; *H Block Report and Order*, 28 FCC Rcd at 9563 ¶ 211.

failure to meet construction requirements as some commenters suggest,⁴⁴² because these proposals may encourage less robust build-out by a licensee that decides not to fully build out to the final benchmark.

149. As a general matter, we expect that AWS-3 band licensees will meet the performance requirements because of the serious consequences associated with non-compliance, including automatic license cancellation. Further, we expect that licensees' deployment will generally exceed the levels set forth in the benchmarks, and that these build-out requirements generally represent a floor – not a ceiling. As for USCC's assertion that automatic termination is too punitive,⁴⁴³ the Commission has explained in the past that we do not consider automatic termination to be overly punitive or unfair, particularly given that the Commission has applied this approach to nearly all geographically-licensed wireless services.⁴⁴⁴ Further, the Commission has rejected the argument, and we do so again here, that an automatic termination penalty would deter capital investment,⁴⁴⁵ observing that the wireless industry has invested billions of dollars and has flourished under this paradigm in other spectrum bands.⁴⁴⁶ For the same reason, we believe that an automatic termination penalty will have little effect on auction participation, as suggested by USCC.⁴⁴⁷ Finally, we do not agree with USCC that automatic termination harms the public because, even if a customer loses service from a provider when it loses spectrum rights for a particular EA or CMA,⁴⁴⁸ alternative providers may be available. We also expect that a future licensee for that EA or CMA may ultimately be able to serve more customers.⁴⁴⁹

150. In the event a licensee's authority to operate terminates, the licensee's spectrum rights would become available for reassignment pursuant to the competitive bidding provisions of section 309(j). Further, consistent with the Commission's rules for other Part 27 spectrum bands, including AWS-1, AWS-4, and H Block, any AWS-3 licensee who forfeits its license for failure to meet its performance requirements would be precluded from regaining the license.⁴⁵⁰ Therefore, we reject Verizon's "new applicant" proposal that would effectively provide a mechanism for a licensee who failed

⁴⁴² AT&T Comments at 14; AT&T Reply Comments at 6; USCC Comments at 69; Verizon Comments at 21; CCA Comments at 9-10; Verizon *Ex Parte* dated Feb. 3, 2014 at 2. Blooston Rural Carriers Reply Comments at 6. Blooston Rural Carriers argues that penalties for failure to meet AWS-3 construction requirements should be limited to a forfeiture of unused spectrum at the final construction milestone pursuant to a "keep what you use" rule that allows for a reasonable interference protection zone around constructed facilities. Blooston Rural Carriers also argues that harsh penalties such as license cancellation are inappropriate because this creates the risk of stranded investment and interruption of service to existing subscribers.

⁴⁴³ USCC Comments at 68.

⁴⁴⁴ See *H Block Report and Order*, 28 FCC Rcd at 9564 ¶ 212; *AWS-4 Report and Order*, 27 FCC Rcd at 16180 ¶ 204; *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band*, WT Docket No. 07-293, IB Docket No. 95-91, GEN Docket No. 90-357, RM-8610, *Report and Order and Second Report and Order*, 25 FCC Rcd 11710, 11796 ¶ 214 (2010) (*2010 WCS Order*); *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band*, WT Docket No. 07-293, IB Docket No. 95-91, *Order on Reconsideration*, 27 FCC Rcd 13651, 13704 ¶ 131 (*2012 WCS Order*).

⁴⁴⁵ USCC Comments at 69.

⁴⁴⁶ *AWS-4 Report and Order*, 27 FCC Rcd at 16180 ¶ 204 (citing *2010 WCS Order*, 25 FCC Rcd at 11796 ¶ 214; *2012 WCS Order*, 27 FCC Rcd at 13704 ¶ 131).

⁴⁴⁷ USCC Comments at 69.

⁴⁴⁸ *Id.* at 68-69.

⁴⁴⁹ See *AWS-4 Report and Order*, 27 FCC Rcd at 16180 ¶ 212.

⁴⁵⁰ See, e.g., 27 C.F.R. § 27.14(a),(q)(6), (r)(4).

to meet the final build-out requirement to continue to hold onto its fallow spectrum unless a competing bidder emerged.⁴⁵¹

151. *Gulf of Mexico.* Having received no comments on the Gulf of Mexico performance requirements, and recognizing that we are licensing wireless service in the Gulf (as EA 176), we adopt the same coverage requirements as set forth above. We note one exception, however: we will calculate “population” pursuant to the approach taken in *Small Ventures Memorandum Opinion and Order*.⁴⁵² In that order, the Wireless Bureau recognized that using the conventional Census tract methodology for determining population in the Gulf of Mexico would be infeasible because the EAs in the Gulf consist of a body of water with non-permanent, mobile residents.⁴⁵³ Consistent with that order, we allow a Gulf of Mexico licensee to use all off-shore platforms, including production, manifold, compression, pumping and valving platforms as a proxy for population in the Gulf of Mexico for purposes of meeting build-out obligations.⁴⁵⁴ Thus, in lieu of measuring its build-out obligations based on population, a licensee serving the Gulf of Mexico shall within six (6) years provide reliable coverage and offer wireless service to at least forty (40) percent of all off-shore platforms in its license areas and within 12 years (or at the end of the license term⁴⁵⁵), provide reliable coverage and offer wireless service to at least 75 percent of all off-shore platforms in its license area in the Gulf of Mexico. All penalties and other compliance procedures adopted herein, excluding those in paragraph 154 below discussing the methodology for meeting population-based build-out requirements, shall apply to a Gulf of Mexico licensee.

152. *Compliance Procedures.* Finding the proposed compliance procedures to be in the public interest and having received no comments on the issue, we adopt the proposal in the *AWS-3 NPRM* to require AWS-3 licensees to comply with Section 1.946(d) of our rules.⁴⁵⁶ Specifically, this rule requires that licensees must demonstrate compliance with their performance requirements by filing a construction notification within 15 days of the relevant milestone certifying that they have met the applicable performance benchmark.⁴⁵⁷ Additionally, consistent with the *AWS-4 Report & Order* and the *H Block R&O*,⁴⁵⁸ we require that each construction notification include electronic coverage maps and supporting documentation, which must be truthful and accurate and must not omit material information that is necessary for the Commission to determine compliance with its performance requirements.⁴⁵⁹

⁴⁵¹ Verizon Comments at 22.

⁴⁵² See *Small Ventures USA, LP and Cellco Partnership d/b/a Verizon Wireless Request for Waiver and Applications for Assignment of 700 MHz C Block License*, WT Docket No. 12-373, *Memorandum Opinion and Order*, 28 FCC Rcd 6569, 6572-73 ¶¶ 9-12 (MD/WTB 2013) (*Small Ventures Memorandum Opinion and Order*).

⁴⁵³ See *Small Ventures Memorandum Opinion and Order*, 28 FCC Rcd at 6572 ¶ 11; see also note 462.

⁴⁵⁴ See *Small Ventures Memorandum Opinion and Order*, 28 FCC Rcd 6569, 6572-73 ¶¶ 9-12.

⁴⁵⁵ If a licensee fails to meet the interim benchmark, the final benchmark and initial license term are accelerated by 2 years – from 12 to 10 years.

⁴⁵⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11531 ¶ 132.

⁴⁵⁷ 47 C.F.R. § 1.946(d) (“notification[s] must be filed with Commission within 15 days of the expiration of the applicable construction or coverage period”).

⁴⁵⁸ See *AWS-4 Report and Order*, 27 FCC Rcd at 16181 ¶ 206; *H Block Report and Order*, 28 FCC Rcd at 9565-66 ¶¶ 215-216.

⁴⁵⁹ *AWS-3 NPRM*, 28 FCC Rcd at 11531 ¶¶ 132-133, 407 (citing 47 C.F.R. § 1.17 (Truthful and accurate statements to the Commission); 47 C.F.R. § 1.917(c) (“Willful false statements . . . are punishable by fine and imprisonment, 18 U.S.C. 1001, and by appropriate administrative sanctions, including revocation of station license pursuant to 312(a)(1) of the Communications Act of 1934, as amended.”)).

153. Electronic coverage maps must accurately depict the boundaries of each license area in the licensee's service territory.⁴⁶⁰ If a licensee does not provide reliable signal coverage to an entire CMA or EA, as applicable, its map must accurately depict the boundaries of the area or areas within each CMA or EA, as applicable, not being served. Each licensee also must file supporting documentation certifying the type of service it is providing for each licensed area within its service territory and the type of technology used to provide such service. Supporting documentation must include the assumptions used to create the coverage maps, including the propagation model and the signal strength necessary to provide reliable service with the licensee's technology.

154. The licensee must use the most recently available decennial U.S. Census Data at the time of measurement to meet the population-based build out requirements.⁴⁶¹ Specifically, a licensee must base its claims of population served on areas no larger than the Census Tract level.⁴⁶² This requirement tracks the Commission's action requiring broadband service providers to report "snapshots" of broadband service at the Census Tract level twice each year by completing FCC Form 477.⁴⁶³

c. Renewal Criteria

155. *Background.* Section 308(b) of the Communications Act authorizes the Commission to require renewal applicants to "set forth such facts as the Commission by regulation may prescribe as to the citizenship, character, and financial, technical, and other qualifications of the applicant to operate the station[,] as well as "such other information as it may require."⁴⁶⁴ In the *AWS-3 NPRM*, the Commission proposed to adopt license renewal requirements consistent with those adopted in the *700 MHz First Report and Order*, the *AWS-4 Report and Order*, and the *H Block R&O*.⁴⁶⁵ Under those requirements, renewal applicants must file a "renewal showing," in which they demonstrate that they have been and are continuing to provide service to the public, and are compliant with the Communications Act and with the Commission's rules and policies.⁴⁶⁶ In the *AWS-3 NPRM*, we proposed to apply to AWS-3 licensees the same renewal showing requirement recently adopted in the *H Block R&O*.⁴⁶⁷

⁴⁶⁰ 47 C.F.R. § 27.14(p)(7).

⁴⁶¹ *Id.* § 27.14(h).

⁴⁶² The Census Bureau defines Census Tracts as "small, relatively permanent statistical subdivisions of a county delineated by local participants as part of the U.S. Census Bureau's Participant Statistical Areas Program . . . T]he entire United States is covered by census tracts." U.S. Census Bureau, http://www.census.gov/geo/www/geo_defn.html#CensusTract (last visited April 1, 2013).

⁴⁶³ See, e.g., Development of Nationwide Broadband Data to Evaluate Reasonable and Timely Deployment of Advanced Services to All Americans, Improvement of Wireless Broadband Subscribership Data, and Development of Data on Interconnected Voice over Internet Protocol (VoIP) Subscribership, WC Docket No. 07-38, *Report and Order and Further Notice of Proposed Rulemaking*, 23 FCC Rcd 9691 (2008). Specifically, the Commission modified FCC Form 477 to require (1) wired, terrestrial fixed wireless, and satellite broadband service providers to report the number of broadband connections in service in individual Census Tracts; and (2) mobile wireless broadband service providers to identify those Census Tracts in which they offer service. See *id.* at 6995-99, ¶¶ 10-16.

⁴⁶⁴ 47 U.S.C. § 308(b). See also *AWS-3 NPRM*, 28 FCC Rcd at 11531 ¶ 134.

⁴⁶⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11531-32 ¶ 134. Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150, *Report and Order and Further Notice of Proposed Rulemaking*, 22 FCC Rcd at 8093-94 ¶¶ 75-77 (2007) (*700 MHz First Report and Order*); *AWS-4 Service Rules R&O* at 16201-16202 ¶ 269-71; *H Block R&O*, ¶¶ 223-227. See also Amendment of Parts 1, 22, 24, 27, 74, 80, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules and Policies for Certain Wireless Radio Services, WT Docket No. 10-112, *Notice of Proposed Rulemaking and Order*, 25 FCC Rcd at 6997-98, 7002-09 ¶¶ 2, 16-32 (2010) (*WRS Renewals NPRM and Order*).

⁴⁶⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11532 ¶ 135. The 700 MHz band renewal showing must include: the level and quality of service provided, whether service was ever interrupted or discontinued, whether service has been provided to rural areas, and any other factors associated with a licensee's level of service to the public. *700 MHz First Report* (continued....)

156. In the *AWS-3 NPRM*, the Commission sought comment on whether AWS-3 band licensees should be awarded renewal expectancies if they meet their performance obligations and otherwise comply with the Commission's rules and policies and the Communications Act throughout their license term.⁴⁶⁸ The Commission also inquired whether licensees should receive a renewal expectancy for subsequent license terms if they continue to provide at least the level of service demonstrated at the final performance benchmark through the end of any subsequent license terms.⁴⁶⁹ Finally, the Commission proposed that, consistent with its 700 MHz licensing paradigm, it would prohibit the filing of competing license renewal applications, and that if a license is not renewed, the associated spectrum would be returned to the Commission for assignment.⁴⁷⁰

157. *Discussion.* Pursuant to Section 308(b) of the Communications Act, we will require AWS-3 band licensees seeking license renewal to file renewal applications; below, we specify the information that renewal applicants must provide to enable the Commission to assess whether renewal is warranted and in the public interest. Where a license is not renewed, the associated spectrum will be returned to the Commission and made available for assignment.⁴⁷¹ We will not permit the filing of competing applications against license renewal applications.

158. We apply to AWS-3 band licensees the same renewal showing requirements we recently adopted for the H Block.⁴⁷² Specifically, an AWS-3 band licensee's renewal showing must provide a detailed description of its provision of service during the entire license period and discuss: (1) the level and quality of service provided (including the population served, the area served, the number of subscribers, and the services offered); (2) the date service commenced, whether service was ever interrupted, and the duration of any interruption or outage; (3) the extent to which service is provided to rural areas; (4) the extent to which service is provided to qualifying tribal land as defined in Section 1.2110(e)(3)(i) of the Commission's rules; and (5) any other factors associated with the level of service to the public. Accordingly, we hereby modify Section 27.14 of the Commission's rules to apply these renewal showing criteria to the AWS-3 bands.⁴⁷³

159. Based on the record before us and our analysis below, we find that the renewal requirements we establish for AWS-3 band licensees are in the public interest and that their benefits outweigh any likely costs. In recent years, the Commission has refined its license renewal policies—beginning with the *700 MHz First Report and Order* in 2007, later in the *AWS-4 Report and Order*, and

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and Order, 22 FCC Rcd at 8093 ¶ 75. See also *AWS-4 Report and Order*, 27 FCC Rcd at 16202 ¶ 271; *H Block Report and Order*, 28 FCC Rcd at 9567-68 ¶ 223. The Commission proposed the tribal lands renewal requirement in the *WRS Renewals NPRM and Order* (subsequent to the *700 MHz First Report and Order*), and first adopted it in the *AWS-4 Report and Order*. *WRS Renewals NPRM and Order*, 25 FCC Rcd at 7043 App. A; *AWS-4 Report and Order*, 27 FCC Rcd at 16202 ¶ 271.

⁴⁶⁷ *AWS-3 NPRM*, 28 FCC Rcd at 11531-32 ¶ 134; *H Block Report and Order*, 28 FCC Rcd at 9567-68 ¶ 223.

⁴⁶⁸ *AWS-3 NPRM*, 28 FCC Rcd at 11532 ¶ 136.

⁴⁶⁹ *Id.* at 11532 ¶ 136.

⁴⁷⁰ *Id.* at 11532 ¶ 137; *WRS Renewals NPRM and Order*, 25 FCC Rcd at 6998, 7013-14 ¶¶ 3, 43-44; *700 MHz First Report and Order*, 22 FCC Rcd at 8093 ¶ 76.

⁴⁷¹ See *WRS Renewals NPRM and Order*, 25 FCC Rcd at 6998, 7013-14 ¶¶ 3, 43-44; *700 MHz First Report and Order*, 22 FCC Rcd at 8093 ¶ 76.

⁴⁷² *H Block Report and Order*, 28 FCC Rcd at 9567-68 ¶ 223.

⁴⁷³ See App. A, 47 C.F.R. § 27.14(s)(6). Nothing in our decision today prejudices or forecloses the Commission's future consideration of the policies and proposed rules, and related record, for the *WRS Renewals NPRM*, which remains pending. See *WRS Renewals NPRM and Order*. In addition, we emphasize that licensees seeking renewal bear the risk of future changes to our rules that may alter this renewal expectancy.

more recently in the *H Block Report and Order*. Through these actions, we have established that licensees must demonstrate that they are providing adequate levels of service over the course of their license terms, and here we act consistently with that policy. Consequently, we adopt renewal criteria for the AWS-3 band that are based on those criteria adopted in the *700 MHz First Report and Order* and that were similarly followed in the *AWS-4 Report and Order* and the *H Block Report and Order*.⁴⁷⁴ We believe these renewal requirements will provide licensees certainty regarding the factors that the Commission will consider during the renewal process, thereby facilitating investment decisions regarding broadband rollout. We also find that these requirements address commenters' concerns that the renewal process not unnecessarily burden licensees or deter investment.⁴⁷⁵

160. In adopting these criteria, we decline to adopt at this time AT&T's proposal to categorically provide a renewal expectancy to all licensees that meet their performance requirements and comply with the Communications Act and the Commission's rules.⁴⁷⁶ USCC claims that renewal expectancies, based solely on performance requirements, would provide certainty to licensees and investors.⁴⁷⁷ As the Commission has consistently stated, performance and renewal showings are distinct; they serve different purposes and, if not met, the Commission may apply different penalties.⁴⁷⁸ A performance showing provides a snapshot in time of the level of a licensee's service, whereas a renewal showing provides information regarding the level and types of service provided over the course of a license term.⁴⁷⁹ We disagree, therefore, with AT&T's contention that there is "no identifiable benefit" to requiring licensees to make a renewal showing.⁴⁸⁰ We emphasize that where a licensee meets the applicable performance requirements, but fails to provide continuity of service (by, for example, repeatedly discontinuing operations between required performance showings for periods of less than 180 days), the Commission could find that renewal would be contrary to the public interest.⁴⁸¹ Where a licensee fails to meet its interim performance requirement and becomes subject to a 2-year acceleration of both its final performance requirement and its license term, its final performance showing might merely reflect a snapshot in time of compliance with the performance requirement. By contrast, its renewal application must provide a timeline of its provision of service, the percentage of the license-area population covered, and types of service provided over the course of the license term, including any efforts to meet the interim performance requirement.

161. For subsequent license terms, licensees are likely—absent extraordinary circumstances—to obtain license renewal if they submit satisfactory showings demonstrating that they have maintained or exceeded the level of coverage and service required at the final performance benchmark (during the initial

⁴⁷⁴ See *AWS-4 Report and Order*, 27 FCC Rcd at 16202 ¶ 271; *H Block Report and Order*, 28 FCC Rcd at 9567-68 ¶ 223.

⁴⁷⁵ AT&T Comments at 15-16; AT&T Reply Comments at 10, n.39; AT&T *Ex Parte* dated March 20, 2014, at 1; T-Mobile Comments at 33; USCC Comments at 56-58.

⁴⁷⁶ AT&T Reply Comments at 10-11; AT&T *Ex Parte* dated March 20, 2014, at 1.

⁴⁷⁷ USCC Comments at 56-57.

⁴⁷⁸ See *AWS-4 Report and Order*, 27 FCC Rcd at 16202 ¶ 270; *700 MHz First Report and Order*, 22 FCC Rcd at 8093 ¶ 75; *WRS Renewals NPRM and Order*, 25 FCC Rcd at 6997-98, 7004-11 ¶¶ 2, 21-35.

⁴⁷⁹ See, e.g., *AWS-4 Report and Order*, 27 FCC Rcd at 16200-01 ¶ 264; *700 MHz First Report and Order*, 22 FCC Rcd at 8093 ¶ 75; *WRS Renewals NPRM and Order*, 25 FCC Rcd at 7004-06 ¶¶ 21-24.

⁴⁸⁰ AT&T Comments at 16.

⁴⁸¹ See *H Block Report and Order*, 28 FCC Rcd at 9569 ¶ 227. We note that, in addressing broadcast license renewal proceedings, Congress has specifically established a standard that takes into consideration not only compliance with Commission rules but also whether "the station has served the public interest, convenience, and necessity." 47 U.S.C. § 309(k).

license term), and otherwise comply with the Commission's rules and policies and the Communications Act.⁴⁸² We decline, however, to "codify" a renewal expectancy as USCC proposes, at this time.⁴⁸³

162. Finally, we reject USCC's proposal that we permit competing renewal applications or, in their absence, process unopposed applications in the same manner as renewals in the cellular and PCS services.⁴⁸⁴ We find that the public interest would be ill-served by permitting the filing of potentially time-consuming and costly competing applications.⁴⁸⁵ The renewal requirements we adopt today will provide Commission staff with ample information to determine whether license renewal would serve the public interest.

d. Permanent Discontinuance of Operations

163. *Background.* In the *AWS-3 NPRM*, the Commission asked whether it should apply to AWS-3 band wireless licensees the rules governing the permanent discontinuance of operations.⁴⁸⁶ According to Section 1.955(a)(3), an authorization will automatically terminate, without specific Commission action, if service is "permanently discontinued."⁴⁸⁷ Consistent with the definition that the Commission adopted for the H Block and the AWS-4 band,⁴⁸⁸ the Commission proposed to define for the AWS-3 band "permanently discontinued" as a period of 180 consecutive days during which the licensee does not provide service in each of its licensed areas to at least one subscriber that is not affiliated with, controlled by, or related to, the provider.⁴⁸⁹ For licensees that use their licenses for private, internal communications, the Commission proposed in the *AWS-3 NPRM* to define "permanent discontinuance" as a period of 180 consecutive days during which the licensee does not operate.⁴⁹⁰ The Commission proposed that licensees would not be subject to these requirements until the date of the first performance requirement benchmark.⁴⁹¹

164. In addition, the Commission proposed that a licensee must notify the Commission within 10 days if it permanently discontinues service, by filing FCC Form 601 or 605 and requesting license cancellation, consistent with Section 1.955(a)(3) of the Commission's rules.⁴⁹² The Commission emphasized that even if a licensee fails to file the required form, however, an authorization will

⁴⁸² *Accord H Block R&O*, 28 FCC Rcd at 9567 ¶ 223 n.695 citing *AWS-4 Report and Order*, 27 FCC Rcd at 16202 ¶ 270; *700 MHz First Report and Order*, 22 FCC Rcd at 8093 ¶ 75.

⁴⁸³ USCC Comments at 56-57 (codifying the availability of a renewal expectancy would provide additional certainty that may prove critical for obtaining outside financing). *See also*, AT&T Comments at 16.

⁴⁸⁴ USCC Comments at 57.

⁴⁸⁵ As the Commission explained in the *700 MHz First Report and Order*, prohibiting competing applications "protects the public interest without creating incentives for speculators to file 'strike' applications." *700 MHz First Report and Order*, 22 FCC Rcd at 8093 ¶ 76; *see also AWS-4 Report and Order*, 27 FCC Rcd at 16202 ¶ 272; *H Block R&O*, 28 FCC Rcd ¶ 224.

⁴⁸⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11533 ¶ 138.

⁴⁸⁷ 47 C.F.R. § 1.955(a)(3).

⁴⁸⁸ *See H Block R&O*, 28 FCC Rcd at 9568 ¶ 230; *AWS-4 Service Rules R&O*, 27 FCC Rcd at 16203 ¶ 274; *WRS Renewals NPRM and Order*, 25 FCC Rcd at 7018 ¶ 54.

⁴⁸⁹ *AWS-3 NPRM*, 28 FCC Rcd at 11533 ¶ 138.

⁴⁹⁰ *Id.* at 11533 ¶ 138.

⁴⁹¹ *Id.* at 11533 ¶ 138.

⁴⁹² *Id.* at 11533 ¶ 138.

automatically terminate without specific Commission action if service is permanently discontinued.⁴⁹³ The Commission sought comment on these proposals, including their associated costs and benefits.⁴⁹⁴

165. *Discussion.* We adopt the Commission's proposal and determine that Section 1.955(a)(3) of the Commission's rules will apply to all AWS-3 band licensees, including holders of both EAs and CMAs, and find that the benefits of applying this rule outweigh any potential costs of doing so.⁴⁹⁵ Thus, a licensee's authorization will automatically terminate, without specific Commission action, if service is "permanently discontinued."⁴⁹⁶ AT&T does not object to the discontinuance proposal but asks for clarification of Section 1.9030(d)(5) of the Commission's rules on long-term *de facto* transfer leasing arrangements to count a lessee's continuous service toward the underlying licensee's service obligation in order to avoid triggering the permanent discontinuance rule.⁴⁹⁷ Any performance or build-out requirement applicable under a license authorization always remains a condition of the license, and the legal responsibility for meeting such obligation is not delegable to the spectrum lessee(s).⁴⁹⁸ An AWS-3 licensee is also accountable for any discontinuance of operation and the rules will be enforced against the licensee regardless of whether the licensee was relying on the activities of a lessee to meet particular performance requirements.⁴⁹⁹ However, the licensee may attribute to itself the build-out or performance activities of its spectrum lessee(s) for purposes of complying with any applicable build-out or performance requirement.⁵⁰⁰

166. In accordance with our proposal, for providers that identify their regulatory status as common carrier or non-common carrier, we define "permanently discontinued" as a period of 180 consecutive days during which the licensee does not provide service in the individual license area (or smaller service area in the case of a partitioned license) to at least one subscriber that is not affiliated with, controlled by, or related to, the provider. We adopt a different approach for wireless licensees that use their licenses for private, internal communications, however, because such licensees generally do not provide service to unaffiliated subscribers.⁵⁰¹ For such private, internal communications, we define "permanent discontinuance" as a period of 180 consecutive days during which the licensee does not

⁴⁹³ *Id.* at 11533 ¶ 138.

⁴⁹⁴ *Id.* at 11533 ¶ 138.

⁴⁹⁵ See 47 C.F.R. § 1.955(a)(3). As the Commission has previously explained, the operation of so-called channel keepers, *e.g.*, devices that transmit test signals, tones, and/or color bars, do not constitute "operation" under Section 1.955(a)(3) or the Commission's other permanent discontinuance rules. See Application of San Diego MDS Co., *Memorandum Opinion and Order*, 19 FCC Rcd 23120, 23124 ¶ 10 (2004) ("in order to provide a service a provider would, at a minimum, need a customer or other person to serve") (*San Diego MDS*); Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Education and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands, WT Docket Nos. 03-66, 03-67, 02-68, 00-230, MM Docket No. 97-217, IB Docket No. 02-364, ET Docket No. 00-258, 21 FCC Rcd 5606, 5731 ¶ 297 (2006) (*BRS/EBS 3rd MO&O*) (favorably citing *San Diego MDS* when affirming that "transmission of test signals and/or color bars by a BRS/EBS licensee or lessee does not constitute substantial service"); *AWS-4 Report and Order*, 27 FCC Rcd at 16203 ¶ 276; *H Block Report and Order*, 28 FCC Rcd at 9571 ¶ 233; see also *WRS Renewals NPRM and Order*, 25 FCC Rcd at 7019 ¶ 59.

⁴⁹⁶ See *id.* § 1.955(a)(3).

⁴⁹⁷ AT&T Comments at 16, n.35 citing, *e.g.*, 47 C.F.R. § 1.9030(d)(5).

⁴⁹⁸ See 47 C.F.R. § 1.9030(d)(5).

⁴⁹⁹ See *id.* § 1.9030(d)(5)(iii).

⁵⁰⁰ See *id.* § 1.9030(d)(5)(i).

⁵⁰¹ See *H Block Report and Order*, 28 FCC Rcd at 9570 ¶ 230, citing *WRS Renewals NPRM and Order*, 25 FCC Rcd at 7022 ¶ 68, 7047 App. A § 1.953.

operate.⁵⁰² A licensee will not be subject to the discontinuance rules until the date it must meet its first performance requirement benchmark,⁵⁰³ a rule which will avoid penalizing licensees that construct early, but then may shut down for 180 days before their first performance benchmark date.⁵⁰⁴

e. Secondary Markets

(i) Partitioning and Disaggregation

167. *Background.* In the *AWS-3 NPRM*, the Commission proposed to permit AWS-3 band licensees to partition geographic markets and disaggregate spectrum under existing Part 27 partitioning and disaggregation rules.⁵⁰⁵ Specifically, it proposed that any entity holding an AWS-3 band license, including parties to any partitioning or disaggregation arrangement pertaining to an AWS-3 band license, must independently meet the applicable technical rules and regulatory requirements, including performance and renewal requirements.⁵⁰⁶ The Commission proposed this approach to facilitate efficient spectrum use, while enabling service providers to configure geographic area licenses and spectrum blocks to meet their operational needs.⁵⁰⁷

168. *Discussion.* We adopt the Part 27 partitioning and disaggregation rules for the AWS-3 band.⁵⁰⁸ Very few commenters discuss partitioning and disaggregation, but those who do support this approach.⁵⁰⁹ Verizon agrees that the Commission “should apply its existing Part 27 geographic partitioning, disaggregation, and spectrum leasing rules to AWS-3 licensees.”⁵¹⁰ Further, permitting disaggregation and partitioning will help facilitate investment and rapid deployment in the AWS-3 band, while giving licensees flexibility to use the spectrum to meet changing market demand. As the Commission noted when it first adopted partitioning and disaggregation rules, allowing this type of flexibility can facilitate the efficient use of spectrum, and expedite provision of services in areas that might not otherwise receive service in the near term.⁵¹¹ We conclude, based on the record before us,⁵¹²

⁵⁰² In other words, the rule that we adopt for private, internal communications does not include a requirement that the licensee provide service to an unaffiliated subscriber in order to avoid triggering the permanent discontinuance rule. *See H Block Report and Order*, 28 FCC Rcd at 9571 ¶ 230, n.726; *see also WRS Renewals NPRM and Order*, 25 FCC Rcd at 7022 ¶ 68, 7047 App. A § 1.953.

⁵⁰³ *See supra* Section III.C.8.b (Performance Requirements).

⁵⁰⁴ *See H Block Report and Order*, 28 FCC Rcd at 9570-71 ¶¶ 230-233; *see also AWS-4 Report and Order*, 27 FCC Rcd at 16203 ¶ 274 (adopting substantially similar permanent discontinuance requirements).

⁵⁰⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11533-34 ¶¶ 139-141. *See* 47 C.F.R. § 27.15. A partitionee or disaggregatee is authorized to hold its license for the remainder of the partitioner’s or disaggregator’s license term. *See* 47 C.F.R. § 27.15(c).

⁵⁰⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11533-34 ¶¶ 139-141.

⁵⁰⁷ *Id.* at 11533-34 ¶¶ 139-141. The Commission most recently adopted this rule for the AWS H Block. *See Service Rules for Advanced Wireless Services H Block—Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz Bands*, WT Dockets No. 12-357, *Report and Order*, 28 FCC Rcd at 9573 ¶ 238 (2013). *See also Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands*, WT Docket Nos. 12-70, 04-356, ET Docket No. 10-142, *Report and Order and Order of Proposed Modification*, 27 FCC Rcd 16102, 16198 ¶ 253 (2012)).

⁵⁰⁸ 47 C.F.R. § 27.15.

⁵⁰⁹ Verizon Comments at 22; Verizon Reply Comments at 3.

⁵¹⁰ Verizon Comments at 22.

⁵¹¹ *Geographic Partitioning and Spectrum Disaggregation by Commercial Mobile Radio Service Licensees*, WT Docket No. 96-148 *Report and Order and Further Notice of Proposed Rulemaking*, 11 FCC Rcd 21831, 21833 ¶ 1 (1996). The Commission observed previously that allowing rural telephone companies to acquire spectrum through geographic partitioning sped the deployment of broadband services in rural areas because rural telephone companies

(continued....)

that permitting partitioning and disaggregation is in the public interest, and the associated benefits would outweigh any potential costs.

169. As proposed in the *AWS-3 NPRM*,⁵¹³ we require any AWS-3 band licensee that is a party to any partitioning or disaggregation arrangement (or combination of both) to independently meet the applicable technical rules and regulatory requirements, including performance and renewal requirements.⁵¹⁴ As the Commission has previously observed, this approach should facilitate efficient spectrum usage and prevent the avoidance of timely construction as a result of the vagaries of the secondary market, while still providing operators with the flexibility to design their networks according to their operational and business needs.⁵¹⁵ Commenters support this approach,⁵¹⁶ which is consistent with our treatment of other Part 27 services.⁵¹⁷ For example, Verizon states that allowing licensees “the ability to partition and/or disaggregate portions of their spectrum holdings, and/or to lease such holdings, promotes a robust secondary market in spectrum.”⁵¹⁸ We agree with Verizon that these rules have been effective and should be applied to the AWS-3 band.⁵¹⁹

(ii) Spectrum Leasing

170. *Background.* In the *AWS-3 NPRM*, the Commission proposed to apply to AWS-3 band licensees the spectrum leasing policies established in various Secondary Market proceedings⁵²⁰ in the

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could rely on existing infrastructure. *Implementation of Section 309(J) of the Communications Act—Competitive Bidding*, PP Docket No. 93-253 *Fifth Report and Order*, 9 FCC Rcd 5532 ¶ 150 (1994).

⁵¹² See Verizon Comments at 22; Verizon Reply Comments at 3.

⁵¹³ *AWS-3 NPRM*, 28 FCC Rcd at 11534 ¶ 140.

⁵¹⁴ See 47 C.F.R. § 27.15(d) (addressing compliance with construction requirements); See *infra* App. A, 27 C.F.R. § 27.14(s)(6).

⁵¹⁵ *AWS-4 Report and Order*, 27 FCC Rcd at 16196 ¶ 253; *WRS Renewals NPRM and Order*, 25 FCC Rcd at 7029 ¶ 91; *H Block Report and Order*, 28 FCC Rcd at 9573 ¶ 238. See Verizon Comments at 23.

⁵¹⁶ See Verizon Comments at 22; Verizon Reply Comments at 3; TIA Comments at 14.

⁵¹⁷ See 47 C.F.R. § 27.15(c); 47 C.F.R. § 27.1 (setting forth the services covered under miscellaneous wireless communications services (WCS)).

⁵¹⁸ Verizon Comments at 23.

⁵¹⁹ Verizon Comments at 23.

⁵²⁰ See Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, WT Docket No. 00-230, *Report and Order and Further Notice of Proposed Rulemaking*, 18 FCC Rcd 20604 (2003) (*Secondary Markets First Report and Order*), *Erratum*, 18 FCC Rcd 24817 (2003); Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, WT Docket No. 00-230, *Second Report and Order, Order on Reconsideration, and Second Further Notice of Proposed Rulemaking*, 19 FCC Rcd 17503 (2004) (*Secondary Markets Second Report and Order*). The Commission has added more terrestrial services to this spectrum leasing framework, including the AWS-1 in 2003 (*AWS-1 Report and Order*); the Broadband Radio Services and Educational Broadband Services in 2004 (Amendment of Parts 1, 21, 73, 74 and 101 of the Commission’s Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands, WT Docket Nos. 03-66, 03-67, 02-68, 00-230, MM Docket No. 97-217, *Report and Order and Further Notice of Proposed Rulemaking*, 19 FCC Rcd 14165, 14232-34 ¶¶ 177-181 (2004)); the AWS-4 in 2012 (Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands, Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz, Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz and 2175-2180 MHz Bands, WT Docket Nos. 12-70, 04-356, ET Docket No. 10-142, *Report and Order and Order of Proposed Modification*, 27 FCC Rcd 16102, 16196-16199 ¶¶ 254-249 (2012); and the H Block in 2013 (*H Block Report and Order*, 28 FCC Rcd at 9573-75 ¶ 239-242).

same manner that those policies and rules apply to other Part 27 services.⁵²¹ Since 2003, these secondary market policies and rules have enabled licensees to lease some or all of their spectrum usage rights to third party spectrum lessees, who are permitted to provide wireless services consistent with the underlying license authorization.⁵²²

171. *Discussion.* We adopt the same spectrum leasing policies and rules that apply to other Part 27 services.⁵²³ Commenters that discuss spectrum leasing support the proposals made in the *AWS-3 NPRM* and agree that adopting spectrum leasing rules will promote the public interest.⁵²⁴ For example, TIA notes that “[c]onsistency with leasing rules that apply to other terrestrial spectrum is a virtue, and helps ensure that future transactions can proceed with greater predictability and transparency.”⁵²⁵ Our secondary markets policies are designed to promote more efficient, innovative, and dynamic use of the spectrum, expand the scope of available wireless services and devices, enhance economic opportunities for accessing spectrum, and promote competition among providers.⁵²⁶ Likewise, allowing spectrum leasing in the AWS-3 band will serve these same purposes.⁵²⁷ We also observe that “[f]or a particular spectrum band, spectrum leasing policies generally follow the same approach as the partitioning and disaggregation policies for the band.”⁵²⁸ Thus, our decision to permit spectrum leasing in the AWS-3 band is consistent with our determination above to permit partitioning and disaggregation of AWS-3 band spectrum.⁵²⁹

9. Other Operating Requirements

172. *Background.* In the *AWS-3 NPRM*, the Commission explained that even though we issue licenses in the AWS-3 band pursuant to one rule part (Part 27), we may require licensees in this band to comply with rules contained in other parts of the Commission’s rules, depending on the particular services they provide.⁵³⁰ The Commission sought comment on whether we need to modify any provisions in existing, service-specific rules to ensure that we cover AWS-3 band licensees under the necessary Commission rules.⁵³¹ In addition, the Commission sought comment on any rules that would be affected by the proposal to apply elements of the framework of these rule parts, whether separately or in conjunction with other requirements.⁵³²

⁵²¹ *AWS-3 NPRM*, 28 FCC Rcd at 11534-35 ¶¶ 142-143. See, e.g., 47 C.F.R. 1.9005(j).

⁵²² *Secondary Markets First Report and Order*, 18 FCC Rcd at 20609-13, 20648-49 paras. 8-9, 12-13, 91-92.

⁵²³ *Id.* at 20609-13, 20648-49 ¶¶ 8-9, 12-13, 91-92. Wireless Radio Services do not include satellite services. 47 C.F.R. § 1.907. Under these secondary market policies and rules, the service rules and policies applicable to the licensee under its license authorization—including all technical, interference, and operational rules—apply to the spectrum lessee as well. *Secondary Markets First Report and Order*, 18 FCC Rcd at 20648-49 ¶¶ 91-92; see 47 C.F.R. §§ 1.9020(c)-(d), 1.9030 (c)-(d), 1.9035(c)-(d). The rules and procedures for spectrum leasing arrangements are set forth in Part 1, Subpart X. 47 C.F.R. §§ 1.9001 *et seq.*

⁵²⁴ See Verizon Reply Comments at 3; TIA Comments at 14. *But see*, USCC Comments at 34 (arguing that for a variety of reasons, small and medium size carriers are likely to encounter substantial delays and costs in obtaining spectrum in the secondary market).

⁵²⁵ TIA Comments at 14.

⁵²⁶ See *Secondary Markets First Report and Order*, 18 FCC Rcd at 20607 ¶ 2.

⁵²⁷ *AWS-3 NPRM*, 28 FCC Rcd at 11534 ¶ 142.

⁵²⁸ *AWS-4 NPRM*, 27 FCC Rcd at 16198 ¶ 258.

⁵²⁹ See *supra* at Section III.C.8.e(i) (Partitioning and Disaggregation).

⁵³⁰ *AWS-3 NPRM*, 28 FCC Rcd at 11535-36 ¶¶ 144-145.

⁵³¹ *Id.* at 11535-36 ¶ 145.

⁵³² *Id.*

173. *Discussion.* Although we primarily adopt rules for the AWS-3 band in Part 27, in order to maintain general consistency among various wireless communication services, we also require AWS-3 licensees to comply with certain other rule parts that pertain generally to wireless communication services. No commenter opposes this approach.⁵³³ Section 27.3 of the Commission's rules lists some of the rule parts applicable to wireless communications service licensees.⁵³⁴ In addition, other FCC rules may apply to wireless licensees, including those that apply only to certain wireless licensees, depending on the specific type of service or services that a particular licensee provides.⁵³⁵ We thus find it appropriate to apply Section 27.3 and the rules referenced therein, as well as similar rules applicable to wireless communications service licensees, to AWS-3 band licensees. In so doing, we will maintain consistency among various wireless communications services which we find will best serve the public interest. For these same reasons, we also find that the benefits of this approach outweigh any potential costs.

10. Facilitating Access to Spectrum and the Provision of Service to Tribal Lands

174. *Background.* The *AWS-3 NPRM* explained that the Commission is currently considering various provisions and policies intended to promote greater use of spectrum over Tribal lands.⁵³⁶ The Commission proposed to extend any rules and policies adopted in that proceeding to any licenses that may be issued through competitive bidding in this proceeding. The Commission sought comment on this proposal and any costs and benefits associated with it.

175. *Discussion.* We will extend any rules and policies adopted in the Tribal Lands proceeding to any AWS-3 license that may be issued through competitive bidding.⁵³⁷ Because that proceeding is specifically focused on promoting greater use of spectrum over Tribal lands, we find that it is better suited than the instant proceeding to reach conclusions on that issue.

11. Competitive Bidding Procedures

176. As discussed above, the Spectrum Act requires the Commission to grant new initial licenses for the use of spectrum in certain specified frequency bands through a system of competitive bidding.⁵³⁸ We will therefore assign licenses in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands by auction. We will conduct any auction for licenses in these bands pursuant to our standard competitive bidding rules found in Part 1, Subpart Q of the Commission's rules and will provide bidding credits for qualifying small businesses, as proposed in the *AWS-3 NPRM*. Below we discuss our reasons for adopting the relevant proposals.

⁵³³ See HIA Comments at 1-3 (encouraging the Commission to ensure the full applicability of its hearing aid compatibility rules as it unleashes new AWS-3 spectrum).

⁵³⁴ 47 C.F.R. § 27.3.

⁵³⁵ See, e.g., *id.* Part 9 (wireless licensees providing interconnected VoIP services are subject to E911 service requirements); see generally, Parts 20, 22, 24, 27 and 101 for other wireless licensee obligations.

⁵³⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11536 ¶ 146. Improving Communications Services for Native Nations by Promoting Greater Utilization of Spectrum over Tribal Lands, WT Docket 11-40, *Notice of Proposed Rulemaking*, 26 FCC Rcd 2623 (2011) (*Tribal Lands NPRM*).

⁵³⁷ *Tribal Lands NPRM*, 26 FCC Rcd at 2630-31 ¶¶ 19-20.

⁵³⁸ See 47 U.S.C. § 1451(b)(1), (2). The spectrum, as specified in the Spectrum Act, is as follows (in addition to the spectrum previously addressed in the *H Block R&O*): 2155-2180 MHz, 15 megahertz of spectrum identified by NTIA between 1675 and 1710 MHz, and 15 megahertz of contiguous spectrum to be identified by the Commission. See *id.* § 1451(b)(2). As noted above, NTIA identified the 1695-1710 MHz band for reallocation from Federal use to non-Federal use, and the Commission has identified the 1755-1780 MHz band in satisfaction of the Spectrum Act's requirement that it identify 15 megahertz of contiguous spectrum in addition to the bands specifically identified in the Act.

a. Application of Part 1 Competitive Bidding Rules

177. The Commission proposed in the *AWS-3 NPRM* to conduct any auction for licenses in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands⁵³⁹ in conformity with the general competitive bidding rules set forth in Part 1, Subpart Q, of the Commission's rules, and substantially consistent with the competitive bidding procedures that have been employed in previous auctions.⁵⁴⁰ Additionally, the Commission proposed to employ the Part 1 rules governing competitive bidding design, designated entity preferences, unjust enrichment, application and payment procedures, reporting requirements, and the prohibition on certain communications between auction applicants.⁵⁴¹ Under this proposal, such rules would be subject to any modifications that the Commission may adopt for its Part 1 general competitive bidding rules in the future. The *AWS-3 NPRM* also sought comment on whether any Part 1 rules would be inappropriate or should be modified for an auction of licenses in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands.⁵⁴²

178. The limited comment we received generally supports the Commission's proposed use of its standard competitive bidding rules for an auction of AWS-3 band licenses.⁵⁴³ Verizon Wireless asks the Commission to narrow the scope of section 1.2105(c)'s prohibition on certain communications by (1) confirming that the rule does not apply to unrelated routine business discussions and agreements; (2) confirming that discussions regarding generic technical handset and network issues that occur, for example, in industry standard-setting meetings or with equipment manufacturers, are not prohibited; (3) narrowing the definition of who is an "applicant" to exclude owners of 10% or more of the applicant entity; and (4) shortening the period during which the rule is in effect to end at the close of bidding, rather than that the down payment deadline.⁵⁴⁴ T-Mobile supports Verizon Wireless's request, and submits that the requested changes will not interfere with the primary purposes of the Commission's rule and will enhance competition.⁵⁴⁵ Sprint opposes Verizon Wireless's requested changes to the rule, and cautions against adopting any wide-reaching revisions or alterations that have the potential consequence of undermining competition.⁵⁴⁶ Sprint supports the Commission's consideration of the particular circumstances and competitive dynamics surrounding any particular auction in formulating appropriate competitive bidding rules, but submits that a blanket revision to the Commission's competitive bidding rules, or revisions not attuned to the particular competitive dynamics of a specific auction such as the AWS-3 auction, would not promote the public interest.⁵⁴⁷ While Sprint notes that the extraordinary complexity of the broadcast incentive auction might warrant revisions to facilitate participation by smaller bidders, it urges the Commission to carefully scrutinize Verizon Wireless's proposal to relax the rule for an AWS-3 auction.⁵⁴⁸ Other commenters express views on topics that are generally considered after the

⁵³⁹ The *AWS-3 NPRM* also made proposals and solicited comment on applying the Part 1 competitive bidding rules to the 2020-2025 MHz band. However, as discussed in note 1, *supra*, we will defer further consideration of this band until the downlink/uplink status of the adjacent 2000-2020 MHz band is resolved. Accordingly, we limit herein our discussion of the proposals and our decisions concerning competitive bidding procedures to the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands.

⁵⁴⁰ *AWS-3 NPRM*, 28 FCC Rcd at 11536 ¶ 148.

⁵⁴¹ *Id.*

⁵⁴² *Id.*

⁵⁴³ See CCA Comments at 11; T-Mobile Comments at 34; Sprint Reply at 4-6; Verizon Wireless Comments at 16.

⁵⁴⁴ Verizon Wireless Comments at 17-20.

⁵⁴⁵ T-Mobile Reply at 27-28.

⁵⁴⁶ Sprint Reply at 5-6.

⁵⁴⁷ *Id.* at 4-5.

⁵⁴⁸ *Id.* at 5.

adoption of service rules, during the pre-auction process for establishing procedures for conducting an AWS-3 auction.⁵⁴⁹

179. Based on our review of the record and our prior experience with conducting auctions, we conclude that the Commission's Part 1 bidding rules should govern the conduct of any AWS-3 auction. We decline to modify the Part 1 rules as Verizon Wireless requests. We disagree with Verizon Wireless's claim that the Commission has extended the restrictions in section 1.2105(c) to routine business discussions, and that such an extension has resulted in uncertainty for auction applicants as to whether discussions that are unrelated to bids or bidding strategies or to post-auction market structure could violate the rule.⁵⁵⁰ The plain text of the rule makes clear that business discussions and negotiations that are *unrelated* to bids or bidding strategies or to post-auction market structure are not prohibited by the rule.⁵⁵¹ The rule's prohibition has always been aimed at the specific content of an applicant's communication to a competing applicant regardless of the context or situation in which such content is communicated. Conversely, if the content of an applicant's communication does not fall within the prohibition, the particular situation in which the communication occurs will not alone make it a violation. Thus, contrary to Verizon Wireless's assertion, the Commission has not extended the prohibition in section 1.2105(c), because the types of prohibited content have remained unchanged, while the potential contexts and situations in which an applicant is prohibited from communicating that content have always been undefined. Moreover, the Wireless Telecommunications Bureau ("Bureau") has previously issued guidance explaining that, although auction applicants competing for licenses in the same geographic areas, or competing for licenses in the same areas in competing services, must affirmatively avoid all communications with each other that affect, or have the potential to affect, their bids or bidding strategy, this does not mean that all business negotiations between such applicants are prohibited.⁵⁵² We think the Bureau's guidance regarding the applicability of section 1.2105(c) provided to date is sufficiently clear and find the clarification requested by Verizon Wireless to be unnecessary.

180. Given the clarity of our rule, we likewise find it unnecessary to confirm in advance that particular types of discussions or negotiations by particular applicants are in compliance with our rule, or to establish a safe harbor for otherwise prohibited communications made by personnel that an applicant has "walled off" from certain other personnel. We emphasize that the specific types of communications with which Verizon Wireless expresses concern would not fall within the prohibition in section 1.2105(c) unless they divulge bids or bidding strategies or discuss or negotiate settlement agreements, arrangements or understandings of any kind relating to the licenses being auctioned, including agreements

⁵⁴⁹ For example, some parties state their positions on auction design and the use of package bidding for any auction of AWS-3 spectrum, with some in favor and others opposed. See Verizon Wireless Comments at 16-17; TIA Comments at 14; Cellular One Comments at 1-3; USCC Comments at 36-49; USCC Reply Comments at 43-47; Smith Bagley, MTPCS, and Cellular Network Partnership Joint Reply at 4-5. See also AT&T Comments at 13. Likewise, T-Mobile recommends that the Commission make certain changes to its auction procedures concerning how reserve prices, minimum opening bids, and additional bid amounts are calculated. T-Mobile Reply Comments at 25-26. Because those issues are properly considered in the context of the separate, future proceeding to establish procedures for conducting an AWS-3 auction, we will not address those comments here. See AT&T Reply at 13 (package bidding and other auction procedures are traditionally considered after the adoption of service rules).

⁵⁵⁰ See Verizon Wireless Comments at 17-18.

⁵⁵¹ 47 C.F.R. § 1.2105(c) (emphasis added).

⁵⁵² See Wireless Telecommunications Bureau Responds to Questions About the Local Multipoint Distribution Service Auction, *Public Notice*, DA 98-37, 13 FCC Rcd 341, 347 (1998). The public notices issued by the Bureau establishing the procedures for each auction have also provide detailed guidance to auction applicants and bidders regarding section 1.2105(c), including its application to particular types of communications. See, e.g., Auction of H Block Licenses in the 1915-1920 MHz and 1995-2000 MHz Bands Scheduled for January 14, 2014; Notice and Filing Requirements, Reserve Price, Minimum Opening Bids, Upfront Payments, and Other Procedures for Auction 96, *Public Notice*, 28 FCC Rcd 13019, 13024-28 ¶¶ 7-21 (2013).

relating to the post-auction market structure. We conclude that the Bureau's past guidance regarding the applicability of section 1.2105(c) provides sufficient information to allow auction applicants to structure their routine business activities accordingly so that they do not run afoul of the rule.

181. We also decline Verizon Wireless's request to amend the prohibited communications rule in the context of this AWS-3 service rules proceeding to narrow the definition of an "applicant" for purposes of the rule to include only the filing entity and its controlling equity interest holders, or to shorten the period during which the rule prohibiting certain communications is in effect to end at the close of bidding. As noted above, the *AWS-3 NPRM* sought comment on whether any of our Part 1 rules would be inappropriate or should be modified specifically for an auction of AWS-3 spectrum. None of the commenters who advocated revisions to the Part 1 rules explained whether or how their suggestions relate specifically to, or would be particularly necessary or appropriate for, an auction of licenses in the AWS-3 bands. Given the limited record received on this topic, without more comment, we are not inclined to adopt amendments to our general competitive bidding rules in the context of adopting service-specific rules for AWS-3 spectrum.

b. Revision to Part 1 Certification Procedures

182. Section 6004 of the Spectrum Act prohibits "a person who has been, for reasons of national security, barred by any agency of the Federal Government from bidding on a contract, participating in an auction, or receiving a grant" from participating in a system of competitive bidding under section 309(j) required to be conducted under Title VI of the Spectrum Act.⁵⁵³ In 2013, the Commission amended its rules to implement this Spectrum Act mandate by adding a national security certification to the application to participate in competitive bidding.⁵⁵⁴ Accordingly, an AWS-3 auction applicant must certify, under penalty of perjury, that it and all of the related individuals and entities required to be disclosed on the short-form application are not persons who have "been, for reasons of national security, barred by any agency of the Federal Government from bidding on a contract, participating in an auction, or receiving a grant."⁵⁵⁵ As with the other certifications on the short-form application, failure to include the required certification by the applicable filing deadline would render the short-form application unacceptable for filing, and the applicant would be ineligible to participate in the auction.

c. Small Business Provisions for Geographic Area Licenses

183. As discussed in the *AWS-3 NPRM*, in authorizing the Commission to use competitive bidding, Congress mandated that the Commission "ensure that small businesses, rural telephone companies, and businesses owned by members of minority groups and women are given the opportunity to participate in the provision of spectrum-based services."⁵⁵⁶ In addition, Section 309(j)(3)(B) of the Communications Act provides that, in establishing eligibility criteria and bidding methodologies, the Commission shall seek to promote a number of objectives, including "economic opportunity and competition . . . by avoiding excessive concentration of licenses and by disseminating licenses among a wide variety of applicants, including small businesses, rural telephone companies, and businesses owned

⁵⁵³ See 47 U.S.C. §§ 1404(b), (c).

⁵⁵⁴ See 47 C.F.R. § 1.2105(a)(2)(xii); 78 Fed. Reg. 66287 (Nov. 5, 2013); see also Service Rules for the Advanced Wireless Services H Block—Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz Bands, *Report and Order*, 28 FCC Rcd 9483, 9577-78 ¶ 253 (2013) (*H Block R&O*). The Commission noted in the *AWS-3 NPRM* that it would require this additional certification from all applicants in any short-form application to participate in competitive bidding for licenses in the AWS-3 bands that are subject to the Spectrum Act. *AWS-3 NPRM*, 28 FCC Rcd at 11536-37 ¶¶ 147, 149. No commenters addressed this requirement in response to the *AWS-3 NPRM*.

⁵⁵⁵ See 47 C.F.R. § 1.2105(a)(2)(xii).

⁵⁵⁶ *AWS-3 NPRM*, 28 FCC Rcd at 11537 ¶ 150 (quoting 47 U.S.C. § 309(j)(4)(D)).

by members of minority groups and women.”⁵⁵⁷ One of the principal means by which the Commission fulfills this mandate is through the award of bidding credits to small businesses.

184. In the *Competitive Bidding Second Memorandum Opinion and Order*, the Commission stated that it would define eligibility requirements for small businesses on a service-specific basis, taking into account the capital requirements and other characteristics of each particular service in establishing the appropriate threshold.⁵⁵⁸ Further, in the *Part 1 Third Report and Order*, the Commission, while standardizing many auction rules, determined that it would continue a service-by-service approach to defining the eligibility requirements for small businesses.⁵⁵⁹

185. The Commission proposed in the *AWS-3 NPRM* to define a small business as an entity with average gross revenues for the preceding 3 years not exceeding \$40 million, and a very small business as an entity with average gross revenues for the preceding 3 years not exceeding \$15 million.⁵⁶⁰ Under this proposal, small businesses would be provided with a bidding credit of 15 percent and very small businesses with a bidding credit of 25 percent, consistent with the standardized schedule in Part 1 of our rules.⁵⁶¹ This proposal was modeled on the small business size standards and associated bidding credits that the Commission adopted for the AWS-1 band, based on the belief that the AWS-3 bands would be employed for purposes similar to those for which the AWS-1 band is used.⁵⁶² The *AWS-3 NPRM* noted that these small business size standards and associated bidding credits were adopted for the AWS-1 band because of the similarities between the AWS-1 service and the broadband PCS service,⁵⁶³ and that the Commission had followed this approach when proposing small business size standards and associated bidding credits in the *2004 NPRM* and when adopting them in the *AWS-4 Service Rules R&O* and the *H Block R&O*.⁵⁶⁴

186. The Commission sought comment on these proposals, including the costs or benefits of these standards and associated bidding credits, particularly as they may relate to the size of the geographic areas to be served and the spectrum allocated to each license.⁵⁶⁵ The Commission also specifically sought comment on whether the small business provisions it proposed are sufficient to promote participation by businesses owned by minorities and women, as well as rural telephone companies.⁵⁶⁶ The limited

⁵⁵⁷ *Id.* at 11537-38 (quoting 47 U.S.C. § 309(j)(3)(B)).

⁵⁵⁸ Implementation of Section 309(j) of the Communications Act—Competitive Bidding, PP Docket No. 93-253, *Second Memorandum Opinion and Order*, 9 FCC Rcd 7245, 7269 ¶ 145 (1994) (*Competitive Bidding Second Memorandum Opinion and Order*); 47 C.F.R. § 1.2110(c)(1).

⁵⁵⁹ See Amendment of Part 1 of the Commission’s Rules – Competitive Bidding Procedures, *Third Report and Order and Second Further Notice of Proposed Rule Making*, WT Docket No. 97-82, 13 FCC Rcd 374, 388 ¶ 18 (1997) (*Part 1 Third Report and Order*); 47 C.F.R. § 1.2110(c)(1).

⁵⁶⁰ *AWS-3 NPRM*, 28 FCC Rcd at 11538 ¶ 152.

⁵⁶¹ *Id.* at 11538-39 ¶ 153; *see also* 47 C.F.R. § 1.2110(f)(2)(ii), (iii).

⁵⁶² *AWS-3 NPRM*, 28 FCC Rcd at 11538 ¶ 152; *see also* Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands, WT Docket No. 02-353, *Notice of Proposed Rulemaking*, 17 FCC Rcd 24135, 24164-65 ¶¶ 76-77 (2002).

⁵⁶³ *AWS-3 NPRM*, 28 FCC Rcd at 11538 ¶ 152.

⁵⁶⁴ *Id.*; *see also* Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz, and 2175-2180 MHz Bands; Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands; WT Docket Nos. 04-356, 02-35, *Notice of Proposed Rulemaking*, 19 FCC Rcd 19263, 19308-09 ¶¶ 122-23 (2004) (*2004 NPRM*); *AWS-4 Service Rules R&O*, 27 FCC Rcd at 16185 ¶ 217; *H Block R&O*, 28 FCC Rcd at 9581 ¶ 262.

⁵⁶⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11538 ¶ 153.

comment we received on the Commission's proposal to offer small business bidding credits in an auction for the AWS-3 bands is generally supportive.⁵⁶⁷

187. Blooston Rural Carriers support the Commission's proposed small business bidding credits, but ask the Commission to consider offering additional support to incumbent rural carriers in the AWS-3 auction through an additional (cumulative) bidding credit of 15 percent for entities that qualify as a "rural telephone company" or that are a subsidiary or affiliate of a qualified rural telephone company under the Commission's rules.⁵⁶⁸ This bidding credit would be available in addition to any other bidding credit for which an applicant may be eligible, but the credit would be limited to licenses that cover all or part of the rural carrier's certificated wireline service area.⁵⁶⁹ Blooston Rural Carriers submit that such an additional bidding credit would effectively help companies compete with large regional and wireless carriers in their local service territory and with carriers bidding more densely populated areas.⁵⁷⁰ The Commission has previously considered proposals to create an additional rural telephone company bidding credit. In declining to adopt such past proposals, the Commission observed that proponents of this type of credit had been unable "to demonstrate a historical lack of access to capital that was the basis for according bidding credits to small businesses, minorities and women,"⁵⁷¹ and that "[i]n subsequent decisions, large rural telcos have failed to demonstrate any barriers to capital formation similar to those faced by other designated entities."⁵⁷² While the Commission has not intended to apply the Part 1 bidding credit schedule uniformly to all services without any opportunity for the consideration of alternative bidding credits, the schedule of size standards and bidding credits described in our Part 1 rules provides small businesses with consistency and predictability and we are not persuaded that we should deviate from that schedule here.⁵⁷³ As discussed above, the Commission took the characteristics of the AWS-3

(Continued from previous page)

⁵⁶⁶ *Id.* at 11539 ¶ 155. The *AWS-3 NPRM* also proposed to extend any rules and policies adopted in the Commission's Tribal lands proceeding to any assignment of licenses in the AWS-3 bands through competitive bidding. *Id.* at 11536 ¶ 146; *see also Tribal Lands NPRM*, 26 FCC Rcd at 2630-31 ¶¶ 19-20 (2011). No commenter addressed this proposal, and we see no reason to depart from our proposed approach here.

⁵⁶⁷ *See* CCA Comments at 11; Blooston Rural Carriers Reply Comments at 5.

⁵⁶⁸ Blooston Rural Carriers Reply Comments at 5.

⁵⁶⁹ *Id.*

⁵⁷⁰ *Id.* at 5-6.

⁵⁷¹ *See Lower 700 MHz Report and Order*, 17 FCC Rcd at 1090-91 ¶ 176 (citing Implementation of Section 309(j) of the Communications Act – Competitive Bidding, PP Docket No. 93-253, *Fifth Memorandum Opinion and Order*, 10 FCC Rcd 403, 457-8 ¶ 100 (1994)); *H Block R&O*, 28 FCC Rcd at 9580-81 ¶ 260.

⁵⁷² *See Lower 700 MHz Report and Order*, 17 FCC Rcd at 1090-91 ¶ 176 (citing Amendment of Part 1 of the Commission's Rules – Competitive Bidding Procedures, WT Docket No. 97-82, *Order on Reconsideration of the Third Report and Order, Fifth Report and Order, and Fourth Further Notice of Proposed Rule Making*, 15 FCC Rcd 15293, 15320-21 ¶ 52 (2000); Revision of Part 22 and Part 90 of the Commission's Rules to Facilitate Future Development of Paging Systems; Implementation of Section 309(j) of the Communications Act – Competitive Bidding, *Memorandum Opinion and Order on Reconsideration of the Third Report and Order*, 14 FCC Rcd 10030, 10091-92 ¶ 114 (1999); Amendment of the Commission's Rules to Establish New Personal Communications Services, Narrowband PCS; Implementation of Section 309(j) of the Communications Act – Competitive Bidding, *Narrowband PCS, Second Report and Order and Second Further Notice of Proposed Rule Making*, 15 FCC Rcd 10456, 10476-77 ¶ 41 (2000); Amendment to Parts 1, 2, 87 and 101 of the Commission's Rules to License Fixed Services at 24 GHz, WT Docket No. 99-327, *Report and Order*, 15 FCC Rcd 16934, 16968-69 ¶ 81 (2000)). The Commission pointed out that, due to certain financing programs, "rural telephone companies may have greater ability than other designated entities to attract capital." *Id.*

⁵⁷³ *See* Amendment of Part 22 of the Commission's Rules to Benefit the Consumers of Air-Ground Telecommunications Services, *Order on Reconsideration and Report and Order*, 20 FCC Rcd 19663, 19680 ¶ 36 (2005).

service into consideration when proposing the two size standards and associated bidding credits in the *AWS-3 NPRM*.⁵⁷⁴ Based on the record in this proceeding, we decline to adopt a bidding credit for incumbent rural carriers in addition to the small business bidding credits that we adopt for the AWS-3 bands.

188. CCA also supports the Commission's proposal to offer small business bidding credits, but asks the Commission to amend its bidding credit provisions to better fulfill the purposes of Section 309 of the Communications Act.⁵⁷⁵ CCA asserts that the Commission's thresholds for defining small and very small business are decades old and have not kept pace with the realities of today's marketplace, and that the current definitions have the effect of excluding carriers that have no ability, or limited ability, to participate absent a bidding credit.⁵⁷⁶ CCA notes, by way of example, that the generally acceptable small business size standard for cellular or other wireless telecommunications entities as defined by the Small Business Administration ("SBA") is firms with 1,500 or fewer employees (including affiliates).⁵⁷⁷ CCA urges the Commission to reevaluate its standards when determining eligibility for bidding credits in the AWS-3 auction, rather than using the same small business size standards that were used in prior AWS auctions,⁵⁷⁸ but offers no suggestions regarding what alternative size standards could potentially be used for AWS-3.

189. Based on the Commission's prior experience with the use of bidding credits in spectrum auctions, we believe that the use of bidding credits is an effective tool in achieving the statutory objective of promoting participation by designated entities in the provision of spectrum-based services.⁵⁷⁹ In the absence of small business size standards and bidding credits, designated entities might have less of an opportunity to obtain spectrum in this band. We believe that continuing to extend such benefits to the AWS-3 bands would be consistent with our statutory mandate. We are not persuaded by the record before us that we should adopt small business size standards for AWS-3 that differ from those used in prior AWS auctions. To the contrary, in light of the similarities between AWS-3 and the other AWS services, we adopt for AWS-3 the size standards and associated bidding credits for small businesses used in prior AWS auctions.⁵⁸⁰ Moreover, we continue to believe that use of the small business size standards and credits set forth in the Part 1 schedule provides consistency and predictability for small businesses,⁵⁸¹ and conclude that we would be ill-advised in the absence of any alternative size standards proposals from commenters to adopt changes to our Part 1 bidding credit schedule in the context of a proceeding establishing service-specific rules for the AWS-3 bands. We also note that in first adopting small business size standards for eligibility for designated entity benefits, the Commission rejected the SBA's 1,500 employee standard as a means to qualify as a designated entity.⁵⁸² The Commission concluded that such a definition would be too inclusive and would allow many large telecommunications firms to take

⁵⁷⁴ See *supra* ¶ 185; see also *AWS-3 NPRM*, 28 FCC Rcd at 11538 ¶ 152.

⁵⁷⁵ CCA Comments at 11.

⁵⁷⁶ *Id.*

⁵⁷⁷ CCA Comments at 11-12.

⁵⁷⁸ CCA Comments at 11-12.

⁵⁷⁹ See, e.g., *AWS-1 Report and Order*, 18 FCC Rcd at 25219-20 ¶ 148.

⁵⁸⁰ On March 20, 2014, we requested the U.S. Small Business Administration's approval of our final rule adopting these small business size standards. Letter from Gary D. Michaels, Deputy Chief, Auctions and Spectrum Access Division, Wireless Telecommunications Bureau, Federal Communications Commission, to Khem Sharma, Division Chief, Office of Size Standards, U.S. Small Business Administration, dated March 20, 2014.

⁵⁸¹ See 47 C.F.R. §1.2110(f)(2).

⁵⁸² Implementation of Section 309(j) of the Communications Act – Competitive Bidding, PP Docket No. 93-253, *Second Report and Order*, 9 FCC Rcd 2348, 2396 ¶ 273 (1994).

advantage of preferences not intended for them.⁵⁸³ Accordingly, for the AWS-3 bands, we will define a small business as an entity with average gross revenues for the preceding 3 years not exceeding \$40 million, and a very small business as an entity with average gross revenues for the preceding 3 years not exceeding \$15 million. Under these definitions, small businesses would be provided with a bidding credit of 15 percent and very small businesses with a bidding credit of 25 percent, consistent with the standardized schedule in Part 1 of our Rules.⁵⁸⁴ Given the record before us and the benefits discussed above, we conclude that the potential benefits of our proposals would likely outweigh any potential costs.

d. Commercial Spectrum Enhancement Act Requirements

190. The Commission noted in the *AWS-3 NPRM* that the CSEA established SRF to reimburse Federal agencies operating on certain frequencies that have been reallocated from Federal to non-Federal use for the cost of relocating their operations.⁵⁸⁵ The SRF is funded from cash proceeds attributable to “eligible frequencies” in an auction involving such frequencies.⁵⁸⁶ CSEA requires NTIA to notify the Commission of estimated relocation costs and timelines for relocation from eligible frequencies by eligible Federal entities at least 6 months in advance of a scheduled auction of eligible frequencies.⁵⁸⁷ CSEA further requires that the total cash proceeds from any auction of “eligible frequencies” must equal at least 110 percent of estimated relocation costs of eligible Federal entities,⁵⁸⁸ and prohibits the Commission from concluding any auction of eligible frequencies that falls short of this revenue requirement.⁵⁸⁹

⁵⁸³ *Id.*

⁵⁸⁴ 47 C.F.R. § 1.2110(f)(2)(ii), (iii).

⁵⁸⁵ See 47 U.S.C. § 928 (Spectrum Relocation Fund).

⁵⁸⁶ 47 U.S.C. § 928(b). “Eligible frequencies” are defined as those in the 216-220 MHz band, the 1432-1435 MHz band, the 1710-1755 MHz band, the 2385-2390 MHz band, and any other band of frequencies reallocated from Federal use to non-Federal use or to shared use after January 1, 2003 that is assigned by competitive bidding pursuant to Section 309(j) of the Communications Act, *id.* § 309(j). See *id.* § 923(g)(2).

⁵⁸⁷ 47 U.S.C. § 923(g)(4). On March 20, 2013, the Commission notified NTIA that it “plans to commence the auction of licenses in the 1695-1710 MHz band and the 1755-1780 MHz band as early as September 2014.” *FCC March 2013 Letter to NTIA* at 1.

⁵⁸⁸ See 47 U.S.C. § 309(j)(16)(A). Section 309(j)(16)(A) of the Communications Act, which was added by Section 203(b) of CSEA, required the Commission to revise its existing regulations to prescribe methods by which the total cash proceeds from any auction of licenses authorizing use of “eligible frequencies” shall equal at least 110 percent of the total estimated relocation costs provided to the Commission by NTIA. See *id.* § 309(j)(16)(A). In implementing rules and procedures necessary to comply with CSEA, the Commission amended its reserve price rule to provide that, for any auction of “eligible frequencies” requiring recovery of estimated relocation costs, the Commission will establish a reserve price or prices pursuant to which the total cash proceeds from any auction of eligible frequencies shall equal at least 110 percent of the total estimated relocation costs of provided to the Commission by NTIA. See Implementation of the Commercial Spectrum Enhancement Act and Modernization of the Commission’s Competitive Bidding Rules and Procedures, *Report and Order*, 21 FCC Rcd 891, 894 ¶¶ 6-7 (2006) (implementing provisions of CSEA) (*CSEA Implementation Report and Order*); 47 C.F.R. § 1.2104(c). The Commission also modified its Tribal land bidding credit rule to enable the Commission, in auctions subject to CSEA, to award all eligible applicants tribal land bidding credits on a *pro rata* basis in the event that the net winning bids at the close of bidding (exclusive of tribal land bidding credits) are not sufficient both to meet the reserve price(s) and to award all eligible applicants full tribal land bidding credits. See *id.* at 896-898 ¶¶ 13-16; 47 C.F.R. § 1.2110(f)(3)(v). The reserve price and Tribal land bidding credit rules adopted by the Commission in the *CSEA Implementation Report and Order* remain in effect today.

⁵⁸⁹ See 47 U.S.C. § 309(j)(16)(B).

191. The Commission invited comment on the applicability of the 110 percent requirement in the CSEA⁵⁹⁰ to the various relocation and sharing scenarios discussed in the *AWS-3 NPRM*. The Commission also noted in the *AWS-3 NPRM* that the proceeds of certain spectrum required to be auctioned under Section 6401 of the Spectrum Act are to be deposited in the Public Safety Trust Fund established under Section 6413 of the Spectrum Act, and invited comment on the potential interplay between these Spectrum Act provisions and the CSEA. We received no comment on either of these issues.⁵⁹¹ Accordingly, the 110 percent requirement will be addressed in the context of determining whether and how to establish the reserve price as the final procedures are developed—through a series of public notices with opportunities for comment—that will govern the auction of licenses in the AWS-3 bands.

e. Multi-Stage Auction and Licensing Alternatives for 1.7 GHz

192. The Commission acknowledged in the *AWS-3 NPRM* that the Federal/non-Federal sharing scenarios then under consideration by CSMAC are very complex and workable rules may prove difficult to implement prior to the licensing deadlines imposed by the Spectrum Act. The Commission therefore sought comment on alternative licensing constructs that could facilitate ongoing “operator-to-operator” negotiations between licensees in commercial bands (*e.g.*, 2155 MHz) and Federal agencies occupying complementary Federal bands (*e.g.*, 1.7 GHz), should sharing or relocation for exclusive use not be possible. The Commission asked whether, for example, the license for the commercial bands could be paired with an “overlay” license in Federal bands providing that commercial use of such bands would be entirely contingent upon successful coordination with incumbent Federal users, or alternatively, whether the commercial licenses could grant to the licensee exclusive eligibility status with respect to a future assignment of rights in such Federal bands. The Commission also asked whether an auction could proceed in two stages, to enable the initial assignment of a “negotiation right” and subsequent payments into the Spectrum Relocation Fund to facilitate relocation or upgrades pursuant to the CSEA. Under this scenario, for example, the first stage could assign commercial licenses and any concomitant rights to negotiate with incumbent Federal users for the use of Federal spectrum, with the second stage consisting of a supplementary round with participation limited to eligible commercial licensees, and a reserve price set based on the 110 percent funding requirement established by the CSEA. The Commission invited comment on what approaches would generate the most certainty, and therefore expected value, in the use of the spectrum.

193. T-Mobile, the only commenter that addressed this issue, opposed the issuance of overlay licenses.⁵⁹² While T-Mobile supports operator-to-operator negotiations post-auction in order to maximize commercial licensees’ access to Federal spectrum, it maintains that an overlay license approach would be inconsistent with the Spectrum Act’s preference to relocate federal users to the maximum extent feasible, and with the CSEA, because activities provided for in the statute such as studying relocation options and updating equipment to facilitate clearing or shared use of the spectrum would not be undertaken if overlay licenses are issued.⁵⁹³ T-Mobile also notes that an overlay auction would create uncertainty about exactly what rights a licensee would be granted, which would potentially reduce auction participation and

⁵⁹⁰ See *id.* § 309(j)(8)(D) (as amended by Section 6401(c) of the Spectrum Act).

⁵⁹¹ But see Public Knowledge *Ex Parte*, dated March 13, 2014, at 4 (revenue not required for federal relocation should be distributed in accordance with the Spectrum Act); Public Interest Spectrum Coalition *Ex Parte*, dated February 20, 2014, at 2 and New America Foundation *Ex Parte*, dated March 24, 2014, at 3 (suggesting attribution of a larger share of the proceeds to the 2155-2180 MHz band).

⁵⁹² T-Mobile Comments at 19-20, 34.

⁵⁹³ *Id.*

revenues.⁵⁹⁴ No commenter proposed any alternative licensing constructs or other approaches. Accordingly, based on the record before us, we do not adopt licensing alternatives for 1.7 GHz.

12. Non-Federal Relocation and Cost Sharing (2155-2180 MHz)

194. There are two non-Federal incumbent services still authorized in portions of the 2155-2180 MHz band: there are approximately 250 Fixed Microwave Service (FS) licenses in the 2160-2180 MHz band and approximately five BRS licensees in the 2150-2160/62 MHz band. The FS operations in the 2160-2180 MHz band are typically configured to provide two-way microwave communications using paired links in the 2110-2130 MHz band. While few BRS systems remain, in the past BRS systems were deployed via three types of system configurations: high-power video stations, high-power fixed two-way systems, and low-power, cellularized two-way systems.⁵⁹⁵ Under the Commission's rules, AWS licensees in these bands must protect incumbent operations or relocate the incumbent licensees to comparable facilities, until the applicable "sunset date," after which the incumbents must cease operating if the AWS licensee intends to operate a station in the relevant area.⁵⁹⁶ The Commission's rules also address cost-sharing reimbursement to cover the scenario where relocation of an incumbent system benefits more than one AWS licensee.⁵⁹⁷

195. In the *AWS-3 NPRM*, we proposed to extend to the AWS-3 band the current relocation and cost sharing rules for both the FS in the 2160-2180 MHz band and the BRS in the 2150-2160/62 MHz band and sought comment on our proposal. Comsearch agrees with the Commission's proposal to extend the current relocation and cost sharing rules for both FS in the 2160-2180 MHz band and BRS in the 2150-2160/62 MHz.⁵⁹⁸ Because the 2160-2180 MHz band is paired with the 2110-2130 MHz band, which is subject to relocation and cost sharing under the AWS-1 rules, Comsearch believes that new AWS-3 licensees will face practically the same relocation issues faced by current AWS-1 licensees given that there are still over 120 FS microwave links and 4 BRS systems remaining in the bands, so it seems reasonable that the incumbent protection and relocation rules set forth in Sections 27.1111-1132 of the Rules should be applicable to AWS-3.⁵⁹⁹

196. We conclude that extending the current relocation and cost sharing rules for both FS in the 2160-2180 MHz band and BRS in the 2150-2160/62 MHz serves the public interest because it will continue to accelerate the relocation process and will distribute relocation costs more equitably among the beneficiaries of the relocation.

⁵⁹⁴ *Id.* at 20.

⁵⁹⁵ Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, Including Third Generation Wireless Systems, ET Docket No. 00-258, *Ninth Report And Order and Order*, 21 FCC Rcd at 4480 ¶ 12 (2006) (*AWS Allocation Ninth R&O*). The 2150-2160/62 MHz BRS band is subdivided into two channels: Channels 1 from 2150-2156 MHz and Channel 2a/2 from 2156-2160/62 MHz.

⁵⁹⁶ 47 C.F.R. §§ 27.1250-27.1255, 101.69-101.82; *AWS Allocation Ninth R&O*, 21 FCC Rcd at 4481-4503, 4505-07, 4515-19, 4526-33, ¶¶ 15-54, 58-63, 74-85, 104-125.

⁵⁹⁷ 47 C.F.R. §§ 27.1160-1190.

⁵⁹⁸ Comsearch Comments at 13.

⁵⁹⁹ Comsearch Comments at 14. Noting the Commission's statement that cost sharing was established to address the case where relocation of an incumbent system benefits more than one AWS licensee, Comsearch provides statistics from The CTIA Spectrum Clearinghouse semi-annual report to show that over 1600 links have been relocated since the establishment of cost sharing for AWS in 2006. Comsearch Comments at 14. Comsearch concludes that, since new AWS-3 licensees will benefit from these relocations, cost sharing should be established in the AWS-3 band. Comsearch Comments at 14,

D. Allocation Matters

197. For the frequency bands considered for AWS-3 service, the *AWS-3 NPRM* identified several amendments to Section 2.106 of our rules (Allocation Table)⁶⁰⁰ that would be necessary to accommodate the proposed changes to the use of the bands.⁶⁰¹ Although these proposed amendments drew little specific comment, parties generally supported policies that would necessitate allocation changes to provide for efficient use of the AWS-3 spectrum for mobile broadband services. Accordingly, we modify the Allocation Table for the bands we are designating for AWS-3 use, as discussed below.

1. 1695-1710 MHz

198. The 1695-1710 MHz band is allocated for primary Federal and non-Federal meteorological satellite (MetSat) (space-to-Earth) use. In addition, the 1695-1700 MHz portion of the band is allocated for primary Federal and non-Federal meteorological aids (radiosonde) use, and the 1700-1710 MHz portion of the band is allocated for primary Federal fixed use and secondary non-Federal fixed use.⁶⁰² We are adopting the amendments proposed in the *AWS-3 NPRM* relating to the 1695-1710 MHz band,⁶⁰³ which were unopposed by commenters and supported by a recent NTIA Report.⁶⁰⁴ To facilitate the Spectrum Act's requirement that the Commission allocate this segment of the 1675-1710 MHz band to support wireless broadband use, we are amending the Allocation Table by allocating the 1695-1710 MHz band to fixed and mobile except aeronautical mobile services on a primary basis for non-Federal use.⁶⁰⁵ We decline to allocate the 1695-1710 MHz band to the aeronautical mobile services in order to better protect Federal MetSat earth stations in this band from harmful interference.

199. We are maintaining the primary Federal MetSat (space-to-Earth) allocation in the 1695-1710 MHz band, but are limiting this allocation to 27 Protection Zones within which one or more Federal earth stations will continue to operate. Specifically, we are adopting footnote US88 to provide for the protection of certain Federal earth stations that receive in the 1695-1710 MHz band as well as a few sites below 1695 MHz to ensure there is no impact due to adjacent band emissions. NTIA has endorsed the recommendations contained in a July 2013 Final Report authored by Working Group 1 of the Commerce Spectrum Management Advisory Committee (CSMAC WG-1).⁶⁰⁶ CSMAC WG-1 made recommendations regarding Federal/non-Federal sharing of the 1695-1710 MHz band, including protection zones (*i.e.*, coordination areas) for Federal earth stations in this band.⁶⁰⁷ In addition, we are deleting the primary non-Federal MetSat (space-to-Earth) allocation from the 1695-1710 MHz band, and

⁶⁰⁰ 47 C.F.R. § 2.106.

⁶⁰¹ See *AWS-3 NPRM*, 28 FCC Rcd at 11546-49 ¶¶ 170-75.

⁶⁰² 47 C.F.R. § 2.106.

⁶⁰³ *AWS-3 NPRM*, 28 FCC Rcd at 11546-47 ¶¶ 170-71.

⁶⁰⁴ See *infra*, n.607.

⁶⁰⁵ The service rules that we are adopting today do not authorize fixed use in this band. Nonetheless, a fixed service allocation will harmonize the non-Federal allocations with the adjacent 1710-1755 MHz AWS-1 band and allow for future consideration of low-power fixed use of the band, such as by customer premises equipment, thereby providing maximum flexibility for service providers to better respond to market demand, consistent with past Commission actions. See, e.g., Amendment of the Commission's Rules to Permit Flexible Service Offerings in the Commercial Mobile Services, WT Docket No. 96-6, *First Report and Order and Further Notice of Proposed Rule Making*, 11 FCC Rcd 8965 (1996). In the 1700-1710 MHz band, the primary non-Federal fixed service allocation replaces an existing unused secondary allocation.

⁶⁰⁶ See *NTIA November 2013 Letter* at 1.

⁶⁰⁷ See *NTIA November 2013 Letter*, enclosure titled "Commerce Spectrum Management Advisory Committee Final Report, Working Group 1 – 1695-1710 MHz Meteorological-Satellite, Rev. 1," dated July 23, 2013 (shown in the docket as "[View \(204\)](#)") (CSMAC WG-1 Final Report).

are permitting non-Federal earth stations to continue to receive MetSat data from primary Federal MetSat space stations on an unprotected basis.⁶⁰⁸ See Appendix A for the text of footnote US88.⁶⁰⁹

200. We also remove from the Allocation Table three unused allocations that apply to the 1695-1710 MHz band. First, we delete the primary Federal fixed service allocation from the 1700-1710 MHz band and associated footnote G118 from the Allocation Table. Second, we delete the primary meteorological aids (radiosonde) allocation from the 1695-1700 MHz band.⁶¹⁰ Third, we delete the footnote allocation that allows all other applications in the Earth exploration-satellite service (EESS) (space-to-Earth) besides MetSat applications to operate in the 1695-1710 MHz band.⁶¹¹

2. 2155-2180 MHz

201. The 2155-2180 MHz band is presently allocated on a primary basis to fixed and mobile services in the non-Federal Table as part of the larger 2120-2180 MHz band.⁶¹² The *AWS-3 NPRM* noted the benefits of allowing Federal users to access the AWS-3 bands, including spectrum not presently allocated for Federal use (e.g., 2155-2180 MHz) on Federal lands or properties that are generally unserved by commercial wireless networks. It sought comment on specific locations where such shared use might be appropriate, a suitable regulatory framework for that use, and amendments to the Commission's rules required to facilitate that use.⁶¹³

202. Oceus Networks strongly supports sharing both the 1755-1780 MHz and 2155-2180 MHz bands "on U.S. military bases and ranges for mission-oriented tactical LTE...[and for] capabilities [that] would be able to evolve alongside a commercial technology roadmap."⁶¹⁴ NTIA generally states that it agrees that expanding opportunities for preserving Federal users' access to the AWS-3 bands on Federal lands and military training ranges in areas generally served by commercial networks may allow Federal agencies greater flexibility to meet tactical, training, and other requirements.⁶¹⁵ T-Mobile states that it does not object to Federal use of non-Federal spectrum in areas where commercial providers are not generally providing service, because shared use of AWS-3 spectrum could produce economies of scale

⁶⁰⁸ It appears that more than 160 registered U.S. users of non-Federal direct readout earth stations receive in the 1695-1710 MHz band. See NOAA's 2011 presentation titled "The President's Broadband Initiative: Impacts Upon NOAA Satellite and User" at 4, 9, (available at http://directreadout.noaa.gov/Miami11/2011_presentations.html). See also *Fast Track Report*, note 11 (stating that "Given that the satellite will continue to transmit their signals, receive-only station operators would need to convert to another access mechanism only if and when wireless broadband systems built-out in their area. Since high density metropolitan areas will be the first priority for wireless services, the operators of meteorological-satellite earth stations may find that they can continue to directly access the satellite data unimpeded for some time.").

⁶⁰⁹ The protection zones listed in footnote US88 were extracted from Table 2 of the CSMAC WG-1 Final Report. The complete list of earth station locations, protected center frequencies, and maximum protection radii for channel bandwidths of 5, 10, and 15 megahertz are specified in Table 1 of the CSMAC WG-1 Final Report.

⁶¹⁰ See *Fast Track Report* at 2-2 ("radiosondes operate in the 1675-1683 MHz portion of the band").

⁶¹¹ Previously, the Commission added a reference to international footnote 5.289 ("Earth exploration-satellite service applications, other than the meteorological-satellite service, may also be used in the bands 460-470 MHz and 1690-1710 MHz for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table.") to the United States Table of Frequency Allocations in Section 2.106. In this action, we move this text to new footnote US289, except that the "band 1690-1695 MHz" is specified. We note that footnotes 5.289 and US201 both provide for the same applications using different wording. Therefore, we simplify the U.S. Table by adding the text of footnote US201 to new footnote US289.

⁶¹² 47 C.F.R. § 2.106.

⁶¹³ *AWS-3 NPRM*, 28 FCC Rcd at 11515-16 ¶ 81.

⁶¹⁴ Oceus Networks, Inc. Comments at ii.

⁶¹⁵ See *NTIA November 2013 Letter* at 3.

and scope in for equipment for both Federal and non-Federal users, thereby lowering costs and speeding implementation. However, T-Mobile cautions that it is premature to adopt Federal sharing rules in commercial bands at present because of the urgency in bringing additional spectrum to market for mobile broadband services. T-Mobile therefore recommends that the Commission re-evaluate Federal sharing of commercial spectrum at a later date, when Federal requirements for additional spectrum versus more efficient use of existing spectrum are better understood.⁶¹⁶

203. AT&T states that Oceus has not shown a specific need to provide sharing in the 2155-2180 MHz band, and that allowing Oceus to construct and manage a secondary wireless network in a licensed market would effectively foreclose the ability of the licensee to expand its coverage into that area at a later time.⁶¹⁷ Verizon states that the Commission should promote sharing in bands explicitly identified for shared use, such as the BAS band, 1780-1850 MHz, and the 3.5 GHz band, and not require sharing in bands licensed for exclusive, flexible use.⁶¹⁸ Responding to Oceus's statement that that military bases are underserved by CMRS operators because carriers do not deploy in those areas, Verizon asserts that access to military bases and processes to gain approval to construct and operate wireless facilities on bases make siting there more difficult.⁶¹⁹ Similarly, noting that it has cell sites on more than 130 bases nationwide (and that the number grows as siting negotiations conclude), AT&T also disagrees that there are barriers to DoD using commercial wireless technology, and notes that network buildout on military facilities can be achieved through existing procurement arrangements.⁶²⁰ Oceus responds that it has sought a geographically limited approach for specific military operations but that even broader sharing opportunities will have to be addressed in the future in non-Federal bands, that existing contract vehicles such as AT&T describes are inadequate, and that secondary user would be required to cease interfering by rule if an AWS licensee were to expand coverage into the area of the secondary license.⁶²¹

204. On March 21, 2014, NTIA, on behalf of DoD, requested that the Commission defer action on the specific text of a new US footnote in the Table of Allocations until requirements for a more flexible approach, beyond tactical or training applications in remote areas, can be developed in

⁶¹⁶ T-Mobile Comments at 24-25.

⁶¹⁷ See Letter from Stacey G. Black, Asst. Vice President, Federal Regulatory External and Legislative Affairs, AT&T, to Marlene H. Dortch, Secretary, FCC (dated Mar. 20, 2014) (AT&T Letter dated March 20, 2014) (written *ex parte* response to recent filings) at 2.

⁶¹⁸ See Verizon *Ex Parte* dated March 21, 2014, at 2.

⁶¹⁹ *Id.* at 2 citing, *e.g.*, Oceus *Ex Parte* dated March 12, 2014, Attach. at 9 ("Proposed sharing regime in AWS-3 band provides opportunity for fuller spectrum use by allowing military access to band in geographic areas with limited 2G and 3G carrier buildout.").

⁶²⁰ AT&T *Ex Parte* dated March 20, 2014, at 2-3. AT&T states that, as the result of a contract, it recently added a multitude of cell sites for the United States Army for two of its Combat Training Center (CTC) bases located at Fort Irwin, CA, and Fort Polk, LA, that extended AT&T's local network coverage in California and Louisiana onto both bases to provide LTE coverage that met the specific training area coverage requirements for the Army. AT&T notes that the result included lower cost COTS devices and increased communications coverage that, according to Army Magazine, will "double the number of instrumented entities in CTC battlefields". *Id.* at 3 quoting Scott Gourley, "Combat Training Center Upgraded Support Army Chief's Vision," *Army Magazine*, Feb. 2014, at 47, 50 (*Id.*, AT&T *Ex Parte*, at Attachment). AT&T notes that in this application, the Army simply contracted with AT&T (through its prime contractor Northrop Grumman) for commercial services on the base with no need to seek spectrum sharing relief from the FCC in order to accomplish this mission. *Id.* AT&T *Ex Parte* at 2. CTIA notes that secondary market and other mechanisms already exist to permit agencies or third parties with access to commercial spectrum. See CTIA *Ex Parte* dated March 20, 2014.

⁶²¹ See Letter from Douglas C. Smith, CEO, Oceus Networks, to Marlene H. Dortch, Secretary, FCC (dated Mar. 24, 2014) (Oceus Letter dated March 24, 2014) (written *ex parte* response to recent filings) at 1-2.

consultation with military and industry stakeholders.⁶²² In accordance with NTIA's request, on behalf of DoD, we are deferring action on this matter.

205. We are adopting the other amendments proposed in the *AWS-3 NPRM* relating to the 2155-2180 MHz band,⁶²³ which were unopposed by commenters, by updating and combining footnotes NG153⁶²⁴ and NG178, and numbering the resultant footnote as NG41. Specifically, we: (1) remove the first two sentences from footnote NG153; (2) revise the last sentence in footnote NG153; (3) add language highlighting that all initial non-AWS authorizations in the 2160-2180 MHz band applied for after January 16, 1992 were issued on a secondary basis; and (4) add language highlighting the sunset provisions that apply to Part 101 fixed stations that were authorized on a primary basis.⁶²⁵ We therefore remove footnotes NG153 and NG178, and add footnote NG41 to read as shown in Appendix A.

3. 1755-1780 MHz

206. The 1755-1780 MHz band is presently allocated on a primary basis for Federal fixed, mobile, and space operations (Earth-to-space), but contains no non-Federal allocations.⁶²⁶ However, the *AWS-3 NPRM* observed that this band is allocated internationally on a primary basis to the fixed and mobile services in all three International Telecommunication Union (ITU) Regions.⁶²⁷ The *AWS-3 NPRM* also observed that the 1755-1780 MHz band has several characteristics that make it especially appealing for commercial wireless use,⁶²⁸ and proposed that it be used for mobile uplinks,⁶²⁹ with fixed stations not authorized in the band.⁶³⁰ The *AWS-3 NPRM* also inquired as to the changes necessary to the Allocation Table to permit commercial wireless use of the 1755-1780 MHz band.⁶³¹ Commenters strongly supported

⁶²² See Letter from Karl B. Nebbia, Associate Administrator, Office of Spectrum Management, NTIA, to Julius P. Knapp, Chief, Office of Engineering and Technology, FCC (March 21, 2014) at 2. Earlier, NTIA stated that it agrees that expanding opportunities for preserving Federal users' access to the AWS-3 bands on Federal lands and military training ranges in areas generally served by commercial networks may allow Federal agencies greater flexibility to meet tactical, training, and other requirements. See *NTIA November 2013 Letter* at 3. NTIA also states that its Manual of Regulations already authorizes access to a wide range of non-federal bands for military tactical and training operations, including the 2155-2180 MHz band, on a coordinated basis. NTIA November 2013 Letter, at 3, n.13, citing NTIA Manual at § 7.15.3, available at http://www.ntia.doc.gov/files/ntia/publications/redbook/2013/7_13.pdf.

⁶²³ *AWS-3 NPRM*, 28 FCC Rcd at 11547-48 ¶ 173.

⁶²⁴ Footnote NG153 currently reads as follows: "The band 2160-2165 MHz is reserved for future emerging technologies on a co-primary basis with the fixed and mobile services. Allocations to specific services will be made in future proceedings. Authorizations in the band 2160-2162 MHz for stations in the Multipoint Distribution Service applied for after January 16, 1992, shall be on a secondary basis to emerging technologies." 47 C.F.R. § 2.106, footnote NG153.

⁶²⁵ Part 101 use of the 2160-2180 MHz band is restricted to Common Carrier Fixed Point-to-Point Microwave Service; see 47 C.F.R. § 101.101. Applications for new facilities submitted after the adoption date of the *Notice of Proposed Rulemaking* in ET Docket No. 92-9 (Jan. 16, 1992) "will be granted on a secondary basis only." 47 C.F.R. §§ 101.79(a)(1), 101.101.

⁶²⁶ 47 C.F.R. § 2.106.

⁶²⁷ *AWS-3 NPRM*, 28 FCC Rcd at 11495 ¶ 32.

⁶²⁸ *Id.* at 11496 ¶ 33.

⁶²⁹ *Id.* at 11496 ¶ 34.

⁶³⁰ *Id.* at 11519-20 ¶ 98.

⁶³¹ *Id.* at 11548 ¶ 174.

using the 1755-1780 MHz band for commercial wireless services.⁶³² As noted above, Verizon Wireless supported the proposal to prohibit fixed station use of the band, stating that the authorization of fixed high-gain antennas could cause interference to government operations in that band.⁶³³

207. We concur with commenting parties that a commercial wireless service in the 1755-1780 MHz band is desirable, and establishment of that service requires that we add primary fixed⁶³⁴ and mobile service allocations to the non-Federal Table in that band. That addition will facilitate both Federal/non-Federal sharing, and a near-term spectrum auction, of that band. While that addition was not the focus of commenting parties, it finds implicit support in the record, including support from Federal users of the 1755-1780 MHz band.⁶³⁵ Additionally, we are deleting the existing fixed and mobile allocations from the Federal Table in that band, but are adding new footnote US91 to govern shared Federal/non-Federal use of the 1755-1780 MHz band, as shown in Appendix A.⁶³⁶

208. In addition, we are adopting a non-substantive update to the non-Federal Table by expanding the cross reference to Part 27 of the Commission's rules, which is shown as "Wireless Communications (27)" in the 1710-1755 MHz band, by displaying this cross reference in the 1695-1780 MHz band.⁶³⁷

4. 2020-2025 MHz

209. As proposed in the *AWS-3 NPRM*, we are removing footnote NG177 from the Allocation Table. Footnote NG177 related to the Broadcast Auxiliary Service in the 1990-2110 MHz band transitioning to the 2025-2110 MHz band, and that transition has now been completed.⁶³⁸ Because we are deferring consideration of rules that would apply to the 2020-2025 MHz band, we make no other allocation changes that relate to that band at this time.

5. 2025-2110 MHz

210. The 2025-2110 MHz band is allocated on a primary basis to fixed and mobile services in the non-Federal Table; and on a primary basis to the space operation, Earth exploration-satellite, and

⁶³² See, e.g., CTIA Comments at 10-12; Ericsson Comments at 18-24; Motorola Mobility LLC Comments at 3; Nokia Solutions and Networks Comments at 5; United States Cellular Corporation Comments at 10; AT&T Reply Comments at 1.

⁶³³ Verizon Wireless Comments at 24.

⁶³⁴ As discussed in note 605, *supra*, a fixed service allocation will permit future consideration of low power fixed use of the 1755-1780 MHz band, such as by customer premises equipment, thereby providing maximum flexibility for service providers to better respond to market demand.

⁶³⁵ See *NTIA July 2013 Letter*. The *NTIA July 2013 Letter* included "recent correspondence to NTIA from the Chief Information Officer of the Department of Defense (DoD) that outlines a proposal for making 1755-1780 MHz available for auction and licensing in the near-term, while protecting critical DoD capabilities" *NTIA July 2013 Letter* at 1.

⁶³⁶ See *NTIA November 2013 Letter*, at the enclosures titled "Commerce Spectrum Management Advisory Committee (CSMA) Working Group 3 (WG 3) Report on 1755-1850 MHz Satellite Control and Electronic Warfare;" "Commerce Spectrum Management Advisory Committee (CSMA) Working Group 4: 1755-1850 MHz Point-to-Point Microwave[,] Tactical Radio Relay (TRR)[, and] Joint Tactical Radio System / Software Defined Radio (JTRS/SDR)," Final Report, dated July 24, 2013; and Commerce Spectrum Management Advisory Committee (CSMAC) Working Group 5 (WG-5)[:] 1755-1850 MHz Airborne Operations (Air Combat Training System, Small Unmanned Aircraft Systems, Precision-Guided Munitions, Aeronautical Mobile Telemetry), Final Report (Sept. 16, 2013)."

⁶³⁷ We are also adding missing cross references to Part 27 of our rules in the 1850-2000 MHz band (for 1915-1920 and 1995-2000 MHz bands) and the 2000-2020 MHz band. 47 C.F.R. §§ 2.105(e), 27.5(j)-(k).

⁶³⁸ *AWS-3 NPRM*, 28 FCC Rcd at 11547 ¶ 172.

space research services in the Federal Table.⁶³⁹ In the *AWS-3 NPRM*, the Commission noted and sought comment on the DoD Proposal, under which DoD proposes to relocate key operations from the 1755-1780 MHz band and to obtain increased Federal access to the shared 2025-2110 MHz band.⁶⁴⁰ Comments were initially mixed on this proposal,⁶⁴¹ but most wireless industry commenters subsequently supported the DoD Proposal.⁶⁴² Others also support it or believe it to be preferable to commercial use of the 2025-2110 MHz band, maintaining that 2025-2110 MHz – and especially the 2095-2110 MHz portion – is not a viable candidate band for commercial use, as it would impinge on existing uses.⁶⁴³ Recently, NTIA endorsed the DoD Proposal and recommended amendments to the Allocation Table for the 2025-2110 MHz band to implement military use of that band under specific conditions that protect non-Federal operations.⁶⁴⁴

211. We find the DoD Proposal to be constructive, and consistent with efficient use of both the 1755-1780 MHz and 2025-2110 MHz bands. Commercial use of the former band can occur in a timely manner under the DoD Proposal. Accordingly, we adopt NTIA's recommended amendments, as set forth in Appendix A. Specifically, we are adding primary Federal fixed and mobile service allocations to the 2025-2110 MHz band, limiting Federal use of these allocations to military use, specifying coordination requirements for such operations in accordance with a Memorandum of Understanding between Federal and non-Federal fixed and mobile operations, and providing interference protection and priority to the specified non-Federal fixed and mobile operations in this band; delete footnote US393 and add footnote US92.⁶⁴⁵ These amendments will take effect only after the auction of the 1755-1780 MHz band concludes.⁶⁴⁶

6. Statutory Requirements

212. In discussing any changes to the Allocation Table, the Commission sought specific comment on any special statutory conditions that may apply, noting two particular statutory provisions of special relevance here.

213. First, Congress recognized the potential benefits of flexible spectrum allocations and in 1997 amended the Communications Act to add section 303(y), which grants the Commission the authority to adopt flexible allocations if certain factors are met.⁶⁴⁷ The Commission sought comment on

⁶³⁹ 47 C.F.R. § 2.106.

⁶⁴⁰ *AWS-3 NPRM*, 28 FCC Rcd at 11548-11549 ¶ 175 (Allocation Matters, Other Bands including 2025-2110 MHz). See also *id.* at 11493, 11514 ¶¶ 23, 79, citing *NTIA July 2013 Letter*, at 1-2. See also *id.*, Enclosure 1 (Letter from Teresa M. Takai, Chief Information Officer, DoD, to Lawrence E. Strickling, Assistant Secretary for Communications and Information, NTIA, U.S. Dept. of Commerce (July 17, 2013)).

⁶⁴¹ See, e.g., CTIA – The Wireless Association Comments at 17-18, 23; T-Mobile Comments at 23-24; United States Cellular Corporation Reply Comments at 18-19.

⁶⁴² See ¶ 25, *supra*.

⁶⁴³ See, e.g., Boeing Comments at 4; NAB Comments at 3 and 6; TIA Comments at 11; Raytheon Reply Comments at 7-9.

⁶⁴⁴ See *NTIA November 2013 Letter*, at 2-3.

⁶⁴⁵ See App. A, § 2.106 footnote US92.

⁶⁴⁶ See 47 U.S.C. § 309(j)(16)(B) (“The Commission shall not conclude any auction of eligible frequencies described in section 923(g)(2) of this title if the total cash proceeds attributable to such spectrum are less than 110 percent of the total estimated relocation or sharing costs provided to the Commission pursuant to section 923(g)(4) of this title.”).

⁶⁴⁷ Section 303(y) provides the Commission with authority to allocate spectrum for flexible use if: “(1) such use is consistent with international agreements to which the United States is a party; and (2) the Commission finds, after notice and an opportunity for public comment, that (A) such an allocation would be in the public interest; (B) such use would not deter investment in communications services and systems, or technology development; and (C) such

(continued....)

how best to read Section 303(y) in light of the subsequent mandate of Section 6401 to “allocate the spectrum described [therein] for commercial use.” The Commission also sought comment on whether any allocation changes, together with the proposed service rules, proposed or identified in the *AWS-3 NPRM* or by commenters would satisfy the four elements of Section 303(y) of the Act. Commenters did not address these issues. For the reasons and in light of the specific rules set forth in this order, we conclude that the allocations and service rules adopted herein satisfy these Section 303(y) statutory requirements, to the extent they are not superseded by Section 6401.

214. Section 1062(b) of the National Defense Authorization Act for Fiscal Year 2000 requires that, if “in order to make available for other use a band of frequencies of which it is a primary user, the Department of Defense is required to surrender use of such band of frequencies, the Department shall not surrender use of such band of frequencies until...the [NTIA], in consultation with the [FCC], identifies and makes available to the Department for its primary use, if necessary, an alternative band or bands of frequencies as a replacement for the band to be so surrendered.”⁶⁴⁸ Furthermore, current law requires that “the Secretary of Commerce, the Secretary of Defense, and the Chairman of the Joint Chiefs of Staff jointly certify...that such alternative band or bands provides comparable technical characteristics to restore essential military capability that will be lost as a result of the band of frequencies to be so surrendered.”⁶⁴⁹

215. NTIA states that the amendments to the Allocation Table for the 2025-2110 MHz band that it recommends – and that we are adopting herein – “would provide DoD additional spectrum access to a band with comparable technical characteristics to restore essential military capabilities that will be lost as a result of relocating systems out of 1755-1780 MHz, a statutory requirement under the Secretary of Commerce's, DoD's, and the Chairman of the Joint Chiefs of Staff's joint certification to Congress under the National Defense Authorization Act for Fiscal Year 2000.”⁶⁵⁰ Based on NTIA's representation, we view this statutory provision as satisfied. This rule change will take effect only after the auction for 1755-1780 MHz concludes and the joint certification is submitted to Congress.⁶⁵¹

E. Federal/Non-Federal Coordination

216. In the *AWS-3 NPRM*, the Commission sought comment on coordination procedures including whether coordination models or elements thereof used in different wireless and satellite services would be applicable.⁶⁵² In particular, the Commission sought comment on whether the coordination procedures established for non-Federal licensees to gain early access to adjacent AWS-1 uplink band (1710-1755 MHz) could serve as a model for coordination. The Commission explained that, in AWS-1, the Commission worked closely with NTIA to craft a coordination procedure before the full band transition was completed.

Prior to operating, the AWS-1 licensee was required to contact the appropriate Federal agency to get information necessary to perform an interference

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use would not result in harmful interference among users.” Balanced Budget Act of 1997, 47 U.S.C. § 303(y), Pub. L. No. 105-33, 111 Stat. 251, 268-69.

⁶⁴⁸ Section 1062(b) of the National Defense Authorization Act for Fiscal Year 2000 (Public Law 106-65; 113 Stat. 768); *see also* provisions (Surrender of Department of Defense Spectrum) set out as a note under 47 U.S.C. § 921.

⁶⁴⁹ *Id.*

⁶⁵⁰ *See NTIA November 2013 Letter*, at 2, citing *AWS-3 NPRM*, 28 FCC Rcd at 11549-15550 ¶ 178 (citing Sec. 1062(b)).

⁶⁵¹ *See supra* ¶ 211; 47 U.S.C. 309(j)(16)(B).

⁶⁵² *See AWS-3 NPRM*, 28 FCC Rcd at 11510-11513 ¶¶ 65-76.

analysis.⁶⁵³ The AWS-1 licensee would first perform the interference analysis and then send it to the appropriate designated agency contact for review.⁶⁵⁴ At the end of 60 days, if the Federal agency raised no objection, the AWS-1 licensee was permitted to commence operations.⁶⁵⁵ NTIA required Federal agencies to cooperate with AWS-1 licensees and provide, within 30 days of a request from an AWS-1 licensee wishing to operate within a coordination zone, site-specific technical information that would allow the licensee to complete the interference analysis.⁶⁵⁶ NTIA also required agencies that disapprove of an interference analysis submitted by an AWS-1 licensee to provide the licensee with a detailed rationale for its disapproval.⁶⁵⁷ Finally, Federal agencies were required to work in good faith to identify the source of the harmful interference and work with AWS-1 licensees to eliminate or mitigate the interference.⁶⁵⁸

217. T-Mobile recommends that the Commission pattern the AWS-3 coordination process after the process used by non-Federal licensees to gain early access to AWS-1 spectrum.⁶⁵⁹ Raytheon disagrees and argues that AWS-1 coordination procedures would not offer sufficient protection to the 1695-1710 MHz band.⁶⁶⁰ Motorola recommends that if the Commission does not apply AWS-1 coordination procedures to the AWS-3 spectrum, then it should apply Part 27 coordination procedures.⁶⁶¹ Mobile Future argues that the Commission should work with NTIA to develop an interference protection model, inputs to the model, and the coordination procedure.⁶⁶² Such efforts, Mobile Future continues, should address issues that should be resolved before an auction commences.⁶⁶³

218. The Commission recognizes that bidders need as much certainty as possible regarding the scope of Federal incumbency, relocation timelines, and the potential for temporary or indefinite sharing through geographic or temporal access to spectrum.⁶⁶⁴ Indeed, such certainty is central to meeting the

⁶⁵³ *Id.* at 11510 ¶ 67 citing The Federal Communications Commission and the National Telecommunications and Information Administration—Coordination Procedures in the 1710-1755 MHz Band, *Public Notice*, 21 FCC Rcd 4730 (2006) (*AWS-1 Coordination Procedures PN*).

⁶⁵⁴ *AWS-3 NPRM*, 28 FCC Rcd at 11510 ¶ 67 citing *AWS-1 Coordination Procedures PN*, 21 FCC Rcd at 4733.

⁶⁵⁵ *Id.*

⁶⁵⁶ *Id.*

⁶⁵⁷ *Id.*

⁶⁵⁸ *Id.*

⁶⁵⁹ T-Mobile Comments at 10 citing *AWS-3 NPRM*, 28 FCC Rcd at 11510 at ¶ 67. T-Mobile states that “coordination procedures must be transparent and responsive. For instance, there should be a single Federal point of contact for coordination. In addition, if there is a coordination portal, it must be clear who will operate it. Any coordination portal must be non-proprietary and should be funded through the Spectrum Relocation Fund.” T-Mobile Comments at 11-12.

⁶⁶⁰ Raytheon Reply Comments at ii, iii, and 14.

⁶⁶¹ Motorola Reply Comments at 4.

⁶⁶² Mobile Future Comments at 11-12.

⁶⁶³ *Id.*

⁶⁶⁴ Accord, Annex O Section 0.4.2 (“NTIA expects that the transition plans’ content will provide valuable information to prospective bidders preparing for an auction and to winning bidders planning for their system deployments or leasing strategies.”) and Section 0.5.1 (“With regard to spectrum sharing in eligible frequencies, the statute contemplates a range of potential arrangements including: (1) short-term or temporary sharing in anticipation of the ultimate relocation of federal entities’ spectrum-related operations; (2) long-term or indefinite sharing

(continued....)

goals of the Spectrum Act to fund the Public Safety Broadband Network and to improve the CSEA to facilitate better transparency, coordination, and predictability for bidders and licensees.⁶⁶⁵

1. Post-auction: Federal/Non-Federal Coordination Requirement

a. § 309(j)(16)(C) Condition

219. There are two Federal/non-Federal coordination scenarios: (1) “early access” prior to Federal relocation and (2) permanent sharing. Under the first scenario, the Commission is required to condition non-Federal licenses on not causing harmful interference to relocating Federal operations.⁶⁶⁶ The Spectrum Act did not amend this provision of the original CSEA (2004), which contemplated Federal relocations but not the Federal non-Federal sharing scenario added by the Spectrum Act. Accordingly, we conclude that this statutory provision governs the scenario for which it was adopted—Federal relocations—and that it is inapplicable to the sharing scenario under which termination of the eligible Federal entity’s authorization is unrestricted. We will apply the condition to each AWS-3 license by rule.⁶⁶⁷ Thus, licenses to operate in the 1695-1710 MHz or 1755-1780 MHz bands are subject to the condition that the licensee must not cause harmful interference to an incumbent Federal entity relocating from these bands under an approved Transition Plan. This condition remains in effect until NTIA terminates the applicable authorization of the incumbent Federal entity. Although this statutory license condition does not apply to the permanent sharing scenario added by the Spectrum Act, the rules we adopt today require successful coordination to avoid causing harmful interference to these Federal incumbents.

b. General Coordination Requirement

220. For both coordination scenarios (early access prior to Federal relocation and permanent sharing) successful coordination with Federal incumbents is required prior to operation as follows:

- 1695-1710 MHz: 27 Protection Zones with distances depending on uplink EIRP
- 1755-1780 MHz: unless stated otherwise in a Joint FCC/NTIA public notice (or in a written agreement among all relevant parties) the coordination requirement is as follows depending on the type of Federal authorization(s) involved:
 - *US&P Federal assignments*: Each AWS licensee must contact each Federal agency that has U.S. and Possessions (US&P) authority prior to its first operations in its licensed area to reach a coordination arrangement on an operator-to-operator basis.

(Continued from previous page) _____

between federal entities and non-federal users; and (3) sharing among relocated federal entities and incumbents to make spectrum available for non-federal use.”).

⁶⁶⁵ See Relocation of and Spectrum Sharing by Federal Government Stations—Technical Panels and Dispute Resolution Boards, 78 FR 5310, 5311 (NTIA, Jan. 25, 2013) (the Spectrum Act improved the CSEA provisions to “facilitate better transparency, coordination, and predictability for bidders in FCC spectrum auctions and the ultimate winners of those auctions through, for example, a new requirement that NTIA publish the agencies transition plans on NTIA’s website at least 120 days before commencement of the corresponding FCC auction, with the exception of classified and other sensitive information.”).

⁶⁶⁶ See 47 U.S.C. § 309(j)(16)(C) (Authority to issue prior to deauthorization) (“In any auction conducted under the regulations required by [the 110 percent rule], the Commission may grant a license assigned for the use of eligible frequencies prior to the termination of an eligible Federal entity’s authorization. However, the Commission shall condition such license by requiring that the licensee cannot cause harmful interference to such Federal entity until such entity’s authorization has been terminated by the [NTIA].”)

⁶⁶⁷ See App A., 47 C.F.R. § 27.5(h).

- *Other Federal assignments:* Each AWS licensee must successfully coordinate a proposed operation with each non-US&P Federal incumbent. The default requirement is a nationwide coordination zone with possible revisions and details to be announced in a Joint FCC/NTIA public notice.

221. *Joint FCC/NTIA Public Notice on Coordination Details.* Federal use of the radio spectrum is generally governed by the NTIA while non-Federal use is governed by the Commission.⁶⁶⁸ As such, consistent with the approach used for AWS-1, we believe that any guidance or details concerning Federal/non-Federal coordination should be issued jointly by NTIA and the Commission. In this regard, we authorize and direct the Wireless Telecommunications Bureau to work with NTIA staff, in collaboration with affected Federal agencies or CSMAC members, to develop a joint FCC and NTIA public notice with information on coordination procedures in the 1695-1710 MHz and 1755-1780 MHz bands. We understand that one or more Federal incumbents are proposing to develop one or more online portals, similar to the portal that DoD developed for AWS-1, that would permit AWS licensees to submit coordination data online in a standard format for distribution to the relevant Federal incumbents. Until such online capability exists, the Spectrum Act requires each incumbent agency to include contact information in its Transition Plan.⁶⁶⁹ Until a coordination portal is operational, licensees will have to rely on the point of contact provided in each agency's transition plan.

222. The successful implementation of commercial services in the AWS-3 bands depends upon successful coordination and sharing with Federal users, whether on a temporary basis as Federal systems relocate their operations or on an ongoing, permanent shared basis for those systems that remain in the band. The Federal incumbents in the 1695-1710 MHz and 1755-1780 MHz bands must be able to continue operations free from harmful interference and without being held accountable for interference into new commercial operations while the agencies are operating within their authorized operational parameters. Similarly, federal incumbents remaining in the band must be able to have the flexibility to coordinate with commercial licensees if reasonable modification of existing, grandfathered operations are required in the future. We expect a good faith effort from both the AWS-3 licensees and the Federal incumbents to share information about their systems, agree to appropriate interference methodologies, and communicate results so as to facilitate commercial use of the band. This extends to AWS licensees sharing information with Federal incumbents and cooperating in testing once Federal incumbents develop and implement real-time spectrum monitoring systems around existing Federal operations protected in the 1695-1710 MHz and adjacent bands.

2. Pre-auction Information on Federal Incumbents for Bidders

223. NTIA must post the public version of each approved transition plan on its website no later than 120 days before the start date of the auction.⁶⁷⁰ The transition plans must generally describe an agency's plan for "the implementation by such entity of the relocation or sharing arrangement."⁶⁷¹ The plans the agencies submitted to NTIA and the Technical Panel contain information about the frequencies used, emission bandwidth, system use, geographic service area, timeline for sharing, timeline for transition, and estimated cost of relocation or sharing.⁶⁷² Agencies that will not be able to release the entire plan will need to make a determination regarding what information can be released to reasonably help inform potential bidders about the incumbent Federal uses and the timelines for sharing and relocation.

⁶⁶⁸ See 47 U.S.C. §§ 305(a), 902(b)(2)(A).

⁶⁶⁹ See *id.* § 923(h)(2)(F).

⁶⁷⁰ *Id.* § 923(h)(5).

⁶⁷¹ *Id.* §§ 923(h)(1); 928(d)(2)(A).

⁶⁷² See Annex O, Appendix, Common Format for Transition Plans.

224. *Supplemental Information Access:* Affected agencies are permitted to redact from the publicly-released transition plans classified national security information and “other information for which there is a legal basis for nondisclosure and the public disclosure of which would be detrimental to national security, homeland security, or public safety or would jeopardize a law enforcement investigation” from the publicly-released transition plans.⁶⁷³ In the event that publicly-released transition plans contain incomplete information or lack key information necessary for potential bidders to accurately value the spectrum, the FCC, NTIA, and the affected Federal agencies will collaborate with industry stakeholders on possible supplemental information disclosure processes.⁶⁷⁴ We recognize that any supplemental information disclosure must appropriately protect national security considerations and law enforcement equities in accordance with the statutory requirement. If it is determined that a supplemental information release process will be necessary and can be finalized, a Public Notice will announce the process.

F. Interoperability Requirement

225. In the *AWS-3 NPRM*, the Commission asked commenters to address any specific technical rules for the AWS-3 bands.⁶⁷⁵ USCC, T-Mobile, and several other commenters seek an interoperability requirement among AWS-1 and AWS-3 devices, or at least among AWS-3 devices in the 1755-1780 MHz band (paired with 2155-2180 MHz band), asserting that interoperability creates significant benefits.⁶⁷⁶ USCC urges the Commission to adopt a clear, *ex ante* interoperability requirement, stating that access to interoperable devices by all AWS-3 licensees also would enhance economies of scale, expand roaming opportunities, and promote competition, which would lead to greater investment and innovation and lower costs for consumers.⁶⁷⁷ Specifically, USCC would require that: (1) all AWS-3 mobile devices be capable of transmitting across the entire 1710-1780 MHz uplink band and receiving across the entire 2110-2180 MHz downlink band; and (2) all AWS-3 networks support and permit the use of such mobile devices.⁶⁷⁸ USCC stresses that it is particularly important for the AWS-3 interoperability requirement to obligate licensees to include all of the paired 1755-1780/2155-2180 MHz bands.⁶⁷⁹ USCC states that a failure to adopt this requirement would significantly reduce the value of the AWS-3 spectrum blocks located outside of the current 3GPP Band 10 frequency range (1710-1770 MHz/2110-2170 MHz band).⁶⁸⁰ USCC contends that this could encourage the large national carriers to focus on, and thus monopolize, the other AWS-3 blocks, leaving only the “orphaned” uppermost 10

⁶⁷³ 47 U.S.C. §§ 923(h)(7); 929.

⁶⁷⁴ See, e.g., Letter from Scott K. Bergman, Vice President, Regulatory Affairs, CTIA, to FCC Chairman Wheeler and Commissioners Clyburn, Rosenworcel, Pai, and O’Reilly, and Assistant Secretary Strickling, NTIA, dated Feb. 25, 2014 (proposing a three-stage timeline for release of Federal agencies’ transition plans and technical data under which Federal agencies would open a window for executing non-disclosure agreements to receive information under the second and third stages).

⁶⁷⁵ *AWS-3 NPRM*, 28 FCC Rcd at 11517 ¶ 85.

⁶⁷⁶ USCC Comments at 16-17, USCC Reply Comments at 26-30; T-Mobile Reply Comments at 21-22. See also Sprint Reply Comments at 6; NTCH Reply Comments at 2-3; Blooston Rural Carriers Reply Comments at 6-7; Rural Wireless Association, Inc. Reply Comments at 2, 7-8; Smith Bagley, MTPCS, and Cellular Network Partnership Joint Reply at 3-4.

⁶⁷⁷ USCC Comments at 16-17, USCC Reply Comments at 26-30.

⁶⁷⁸ USCC Comments at 16-17, USCC Reply Comments at 27.

⁶⁷⁹ USCC *Ex Parte* dated Feb. 27, 2014, at 3-4. USCC’s initial interoperability proposal included 1695-1710 MHz and 2095-2110 MHz assuming that the Commission would pair these bands. USCC’s alternative interoperability proposal does not include these bands because “[u]nfortunately, commenters . . . recognize[] that there are potentially significant challenges to reallocating the 2095-2110 MHz band,[cites omitted] and thus pairing this spectrum with the 1695-1710 MHz band.” USCC *Ex Parte* dated Feb. 27, 2014, at 3.

⁶⁸⁰ USCC *Ex Parte* dated Feb. 27, 2014, at 3-4.

megahertz of AWS-3 spectrum potentially available to small and regional carriers, who even collectively lack sufficient market power to drive device development.⁶⁸¹ T-Mobile supports interoperability between AWS-3 and AWS-1 and states that the Commission should require interoperability for future AWS-3 devices.⁶⁸² T-Mobile also asserts that interoperability will promote a global market, not hinder availability, affordability, and portability of user equipment as “boutique” band classes will; as well as delaying deployment of services.⁶⁸³

226. DISH proposes an interoperability requirement similar to USCC’s proposal, except DISH would include the AWS-4 downlink band at 2180-2200 MHz.⁶⁸⁴ Verizon opposes any equipment interoperability mandate⁶⁸⁵ and Verizon and AT&T state that the *AWS-3 NPRM* did not propose or seek comment on an interoperability requirement between AWS-3 and AWS-4.⁶⁸⁶ Verizon also notes that that DISH filed its AWS 1/3/4 interoperability proposal very recently and that there is inadequate time for parties to evaluate it in this proceeding from a technical or other perspective.⁶⁸⁷ DISH acknowledges the timing of its specific interoperability proposal but states that the Commission discussed in detail the efficiencies of combining adjacent AWS-1 spectrum with AWS-3⁶⁸⁸ and that the general concept of

⁶⁸¹ *Id.* See also USCC Comments at 16-17; USCC Reply Comments at 26-30.

⁶⁸² T-Mobile *Ex Parte* dated Feb. 14, 2014, at 1 and attached slide deck at 5. See also T-Mobile Reply Comments at 21-22 (supporting AWS-3 interoperability generally and stating that the Commission should consider an interoperability mandate at least for the 1755-1780 MHz band because this band, when paired with the 2155-2180 MHz band, aligns closely with 3GPP Band Class 10 and devices throughout the band would not be required to span multiple band classes). T-Mobile Reply Comments at 21-22 and n.82 citing Letter from Kris Rinne, Network Technologies SVP, AT&T Mobility; Chris Pearson, President, 4G Americas; Neville Ray, Chief Technology Officer, T-Mobile; Nicola Palmer, Chief Technology Officer, Verizon Wireless; and Steve Largent, President and CEO, CTIA-The Wireless Association, to Lawrence E. Strickling, Assistant Secretary, NTIA, at 1 (dated Apr. 24, 2013).

⁶⁸³ See T-Mobile Reply Comments at 21, n.81 citing T-Mobile 17th Wireless Competition Report Comments at 23; T-Mobile 17th Wireless Competition Report Reply Comments at 19.

⁶⁸⁴ See DISH *Ex Parte* dated March 7, 2014, Attach. at 5. See also DISH *Ex Parte* dated March 14, 2014 at 3 (stating that without an interoperability requirement, the AWS-4 downlink could not be carrier-aggregated with the AWS-3 band because carrier aggregation is not feasible for two immediately adjacent 3GPP bands that use separate filters).

⁶⁸⁵ Verizon *Ex Parte* dated March 14, 2014, at 2. Opposing USCC’s proposal for a spectrum cap to prevent a lack of interoperability in the AWS bands like the one that occurred in the Lower 700 MHz band, Verizon Wireless states that USCC “ignores all of the unique factors that led to the lack of interoperability in [the Lower 700 MHz] band – factors that are entirely absent in the AWS-3 band.” Verizon Wireless Reply Comments at 7 citing USCC Comments at 50-51. “The way for the FCC to ensure interoperability in bands going forward is to establish band plans that will minimize interference” Verizon Wireless Reply at 7-8.

⁶⁸⁶ Verizon *Ex Parte* dated March 19, 2014, at 1-2; AT&T *Ex Parte* dated March 20, 2014, at 1. Regarding an interoperability mandate, AT&T states that it “has not officially opposed the requirement that the paired allocations in AWS-1 and AWS-3 interoperate.” *Id.*

⁶⁸⁷ Verizon *Ex Parte* dated March 19, 2014, at 1-2; see also AT&T *Ex Parte* dated March 20, 2014, at 1-2. Verizon Wireless states that 3GPP standards work that is already underway to develop a single AWS-1/3 band class could be slowed by adding AWS-4 downlink spectrum, delaying AWS-3 deployment and device availability. *Id.* at 2. DISH disagrees with Verizon’s characterization of the current status of 3GPP work: “DISH challenges Verizon to produce evidence to substantiate its claims that 3GPP work has started.” DISH *Ex Parte* dated March 20, 2014, at 1. Verizon responds thusly: As DISH recognizes, 3GPP standards work of this sort is initiated by submitting a work item to a relevant working group. Verizon and T-Mobile have been actively working together to ensure interoperability across the AWS-1 and AWS-3 bands. Indeed, we have drafted and finalized a work item that we—and other industry stakeholders—will submit to the Radio Access Network (RAN4) working group for consideration at its next meeting, which is scheduled to begin on March 31[, 2014]”.

⁶⁸⁸ DISH *Ex Parte* dated March 20, 2014, at 2-3 citing *AWS-3 NPRM*, 28 FCC Rcd at 11495 ¶ 30.

interoperability has been discussed in the record at length as it relates to combining the AWS-1 and AWS-3 bands.⁶⁸⁹ Because the Commission tentatively found that having additional spectrum that is adjacent to that used for like services would promote efficiency in broadband deployment.⁶⁹⁰ DISH asserts that rules that promote efficiency based on the principle of spectrum adjacency would be a logical outgrowth of the *AWS-3 NPRM*'s tentative finding, no matter which side of the AWS-3 downlinks the adjacent spectrum is on.⁶⁹¹ DISH also dismisses as misguided Verizon's suggestion that there may be "technical limitations" that would prevent or delay the addition of 2180-2200 MHz to the AWS downlink ecosystem as follows:

DISH's proposal for interoperability between the AWS-1, AWS-3, and AWS-4 downlink bands impacts only *devices*, which are operating in receive mode and are not subject to any transmit restrictions. Furthermore, nothing in DISH's proposal requires any changes to base stations operating in transmit mode in the downlink band for AWS operators. Therefore, Verizon's introduction of the possible impact of "federal AMT operations at 2200-2290 MHz" on "AWS-3 equipment that also includes the AWS-4 downlink band" is irrelevant. Such federal operations are only relevant to DISH's base stations in 2180-2200 MHz.⁶⁹²

227. The Commission historically has been interested in promoting interoperability. Beginning with the licensing of cellular spectrum, the Commission maintained that consumer equipment should be capable of operating over the entire range of cellular spectrum as a means to "insure full

⁶⁸⁹ *Id.* at 2, n.6 citing "Letter from George Y. Wheeler, Peter M. Connolly, and Leighton T. Brown, United States Cellular Corporation, to Marlene H. Dortch, FCC, GN Docket No. 13-185, at 3 (February 27, 2014) (asking the Commission to require that "(1) all AWS-3 mobile devices be capable of transmitting across the entire 1710-1780 MHz uplink band and receiving across the entire 2110- 2180 MHz downlink band; and (2) all AWS-3 networks support and permit the use of such mobile devices."); Reply Comments of T-Mobile USA, Inc., GN Docket No. 13-185, at 21 (October 28, 2013) ("[T]he Commission should consider an interoperability mandate at least for the 1755-1780 MHz band..."). See also Letter from C. Sean Spivey, Competitive Carriers Association, to Marlene H. Dortch, FCC, GN Docket No. 13-185, at 3 (March 6, 2014) ("CCA urged the Commission to adopt an interoperability requirement for the AWS-3 band."); Reply Comments of the Rural Wireless Association, GN Docket No. 13-185, at 7-8 (filed October 28, 2013) ("[I]t is imperative that the Commission adopt rules requiring interoperability in the AWS-3 band in order to increase deployment of wireless broadband services to rural America. Mandating interoperability across the AWS-3 band will avoid a repeat of the problems small wireless carriers have experienced with obtaining devices that work in the Lower 700 MHz band, which has left them unable to effectively compete against large carriers in their markets and has significantly delayed deployment of services. Not requiring a fully interoperable AWS-3 device ecosystem could result in a repeat of the delayed roll-out of the Lower 700 MHz band."); Letter from Tamara Preiss, Verizon, to Marlene H. Dortch, FCC, GN Docket No. 13-185, at 2 (February 3, 2014) (asking the FCC to "adopt technical rules for the AWS-3 spectrum that are consistent with the rules for the AWS-1 band, including a mobile uplink power limit of +23 dBm EIRP, which will facilitate use of the AWS-3 spectrum and interoperability across AWS bands. We noted the opportunity for industry to promote handset interoperability through the development of a single band class that would cover AWS-1 and paired spectrum at 1755-1780 MHz and 2155-2180 MHz.").

⁶⁹⁰ DISH *Ex Parte* dated March 20, 2014, at 2-3 citing *AWS-3 NPRM*, 28 FCC Rcd at 11495 ¶ 30. DISH acknowledges that the Commission went on to state that "the creation of an additional AWS allocation immediately adjacent to the current AWS-1 allocation would allow for more immediate equipment development and deployment," but DISH describes this as only an application of the general rule that harmonized operations on adjacent spectrum promote efficiency. *Id.* at 3.

⁶⁹¹ *Id.* at 3-4. "Here, the concept of interoperability among both the spectrum to be auctioned (AWS-3) and the immediately adjacent bands (AWS-1 and AWS-4) was adequately noticed in the *AWS-3 NPRM*." *Id.* at 3.

⁶⁹² *Id.* at 1-2 (notes omitted).

coverage in all markets and compatibility on a nationwide basis.”⁶⁹³ Although the Commission did not adopt a rule to require band-wide interoperability for PCS, it again stressed the importance of interoperability by acknowledging industry efforts to establish voluntary interoperability standards and asserted that “[t]he availability of interoperability standards will deliver important benefits to consumers and help achieve our objectives of universality, competitive delivery of PCS, that includes the ability of consumers to switch between PCS systems at low cost, and competitive markets for PCS equipment.”⁶⁹⁴ The Commission also stated that if PCS technology did not develop in a manner to accommodate roaming and interoperability, it might consider “what actions the Commission may take to facilitate the more rapid development of appropriate standards.”⁶⁹⁵ In 1997, we established a rule requiring receiver interoperability for satellite digital audio radio services,⁶⁹⁶ and in implementing authority over public safety broadband systems prior to the Spectrum Act, the Commission determined in 2007 that it was “imperative” to establish a nationwide broadband interoperability standard.⁶⁹⁷ More recently, in WT Docket No. 12-69, the Commission took certain steps to implement an industry solution to provide interoperable Long Term Evolution (LTE) service in the Lower 700 MHz band in an efficient and effective manner to improve choice and quality for consumers of mobile services.⁶⁹⁸ A number of the principal wireless providers licensed in the 700 MHz band, along with the Competitive Carriers Association, had developed a voluntary industry solution that would resolve the lack of interoperability in this band while allowing flexibility in responding to evolving consumer needs and dynamic and fast-paced technological developments. In reviewing the voluntary solution, the Commission determined that amendments to the rules and modifications to licenses serve the public interest by enabling consumers, especially in rural areas, to enjoy the benefits of greater competition and more choices, and by encouraging efficient use of spectrum, investment, job creation, and the development of innovative mobile broadband services and equipment.⁶⁹⁹ Although no party requested that we impose an interoperability requirement with respect to the 10 megahertz of H Block spectrum, as they have for the larger AWS-3 band in this proceeding, we stressed again in that context that “interoperability is an important aspect of future deployment of mobile broadband services and generally serves the public interest.”⁷⁰⁰

228. In the *AWS-3 NPRM*, the Commission noted that, where possible, it was proposing to adopt for AWS-3 the same technical rules that apply to AWS-1⁷⁰¹ and wireless industry commenters

⁶⁹³ Inquiry Into the Use of the Bands 825-845 MHz and 870-890 MHz for Cellular Communications Systems; and Amendment of Parts 2 and 22 of the Commission’s Rules Relative to Cellular Communications Systems, CC Docket No. 79-318, *Report & Order*, 86 FCC 2d 469, 482 (1981) (*Cellular Report and Order*). The Commission adopted band-wide interoperability requirements for cellular service. *Id.*

⁶⁹⁴ Amendment of the Commission’s Rules to Establish New Personal Communications Services, RM-7140, RM-7175, RM-7618, GEN Docket No. 90-314, *Memorandum Opinion and Order*, 9 FCC Rcd 4957, 5021-22 ¶¶ 163-64 (1994) (*Broadband PCS Memorandum Opinion and Order*).

⁶⁹⁵ *Id.* at 5022 ¶ 164.

⁶⁹⁶ Establishment of Rules and Policies for the Digital Audio Radio Service in the 2310-2360 MHz Frequency Band, *Report and Order [and] Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 27 FCC Rcd 5754 ¶¶ 103, 106 (1997).

⁶⁹⁷ Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, WT Docket No. 06-150, *Second Report and Order*, 22 FCC Rcd 15289, 15291 ¶ 363 (2007).

⁶⁹⁸ See Promoting Interoperability in the 700 MHz Commercial Spectrum, WT Docket No. 12-69, *Report and Order and Order of Proposed Modification*, 28 FCC Rcd 15122 (2013) (*Lower 700 MHz Interoperability R&O*).

⁶⁹⁹ See *id.*

⁷⁰⁰ *H Block R&O*, 28 FCC Rcd at 9498 ¶ 32.

⁷⁰¹ See *AWS-3 NPRM*, 28 FCC Rcd at 11517 ¶ 85.

overwhelmingly supported this approach—with strong objections to the Commission’s proposal to depart from the AWS-1 power limit for mobiles and portables.⁷⁰² The Commission also asked whether to pair any of the proposed AWS-3 band segments, and whether there are likely to be any competitive effects of the pairing choice that it should consider.⁷⁰³ Wireless industry commenters overwhelmingly urge us to designate 1755-1780 MHz for AWS paired with 2155-2180 MHz due to its adjacency to AWS-1.⁷⁰⁴ Indeed, for well over the past decade, the wireless industry has sought commercial use of the 1710-1780 MHz Federal band to pair with the 2110-2180 MHz non-Federal band. In 2006, the Commission issued licenses for AWS-1 at 1710-1755/2110-2155 MHz. In 2008, the Commission proposed AWS service rules for 2155-2180 MHz unpaired, and most wireless industry commenters in that proceeding urged the Commission to defer action until 2155-2180 MHz could be licensed paired with 1755-1780 MHz. As discussed above, the record now before us overwhelmingly indicates that licensing 1755-1780 MHz paired with 2155-2180 MHz is ideal precisely because it is contiguous to and can be used as an extension of the AWS-1 bands.⁷⁰⁵ AT&T, in supporting the pairing of 1755-1780 MHz and 2155-2180 MHz, states that “[t]he ability to combine the AWS-3 and AWS-1 bands in a single band class would result in more efficient spectrum utilization and more efficient LTE networks.”⁷⁰⁶ The existence of Band Class 10 supports this conclusion but, as USCC and other commenters have noted, it could also result in outcomes inimical to the public interest—operations in the United States limited to Band 10, *e.g.*, if large carriers focused on blocks within Band 10 leaving 1770-1780/2170-2180 MHz “orphaned.”⁷⁰⁷

229. To the extent that smaller operators favor smaller license sizes, we note that the AWS-3 paired block that we are designating for the smallest geographic licensing area (CMAs) and all of the smallest, 5 megahertz paired blocks, are within existing Band Class 10. Additionally, based on the record before us, we conclude that the public interest is best served by requiring AWS-3 mobile and portable stations that operate on any frequencies in the 1755-1780 MHz band (paired with the 2155-2180 MHz band) to be capable of operating on all frequencies in the 1710-1780 MHz band (paired with the 2110-2180 MHz band) using all air interfaces that the equipment utilizes on any frequencies in the 1710-1780 MHz band (paired with frequencies in the 2110-2180 MHz band). Although Section 6401 of the Spectrum Act would require us to auction and license these bands by February 2015 pursuant to flexible use service rules whether or not we adopt an additional interoperability requirement, we conclude that adopting such a requirement prior to licensing best serves the public interest by removing uncertainty, *e.g.*, for potential applicants that intend to follow 3GPP standards if licensed in the 1755-1780 MHz and 2155-2180 MHz bands.⁷⁰⁸ With an assurance of basic interoperability across 1755-80 MHz (paired with

⁷⁰² See *supra* section, III.B.3.b (Mobile and Portable Stations (1695-1710 MHz and 1755-1780 MHz)). “The Commission should adopt technical rules for the AWS-3 spectrum that are consistent with the rules for the AWS-1 band . . . which will facilitate use of the AWS-3 spectrum and interoperability across AWS bands.” Verizon *Ex Parte* dated Feb. 3, 2014, at 2.

⁷⁰³ AWS-3 NPRM, 28 FCC Rcd at 11501¶ 48.

⁷⁰⁴ See paras. 42-44, *supra*.

⁷⁰⁵ See paras. 42-44, *supra*.

⁷⁰⁶ AT&T Comments at 6. See also CTIA Reply Comments at 3-7 stating that the opening comments demonstrate the key public interest benefits of this pairing and that “[t]hese factors make it highly likely that a new, internationally harmonized AWS-1/AWS-3 band class would result in significant economies of scale and allow for more immediate equipment development and deployment.” CTIA Reply Comments at 7, n.18 quoting AT&T Comments at 7.

⁷⁰⁷ See text accompanying note 681, *supra*.

⁷⁰⁸ As several commenters note, voluntary industry band classes for commercial systems can significantly benefit or harm consumers. “Adopting an interoperability requirement will help to ‘promote timely access to a variety of mobile devices by all AWS-3 licensees, including small and regional carriers’ while preventing a situation, like that in the 700 MHz band, where manufacturers focused on the needs of the larger carriers, which significantly delayed

(continued....)

2155-2180 MHz) and AWS-1, potential licensees, particularly smaller ones, will face less uncertainty over the development of a healthy device ecosystem.⁷⁰⁹ We note that at this time this rule applies to AWS-3 licensees and AWS-3 bands as described herein. We adopt this basic interoperability requirement pursuant to our separate authority under Title III of the Communications Act.⁷¹⁰

230. Consistent with precedent, we stress the importance of promoting interoperability throughout the 1710-1780 MHz/2110-2180 MHz band—as reflected in the industry efforts to establish voluntary interoperability standards covering most of this spectrum and the overwhelming industry representations herein, and for well over the past decade before Congress, the Executive Branch, internationally, and the Commission, as to the suitability of the 1710-1780 MHz band (paired with 2110-2180 MHz) for AWS operations. Indeed, a failure to achieve basic interoperability of devices using the same air interface(s) in the 1710-1780 MHz band (paired with the 2110-2180 MHz band) would be completely at odds with longstanding commercial wireless industry-wide efforts for access to additional spectrum. With this in mind, we emphasize that the availability of voluntary interoperability standards will deliver important benefits to consumers and help achieve our objectives of universality, competitive delivery of devices that utilize the 1710-1780 MHz band (paired with the 2155-2180 MHz band) because devices that operate in the 1755-1780 MHz band (paired with 2155-2180 MHz) will include the AWS-1 bands, thereby promoting the ability of consumers to switch between AWS systems that use the same air interface(s) at low cost, and competitive markets for equipment.”⁷¹¹

231. Finally, we recognize that USCC initially sought an interoperability requirement that extends to 1695-1710 MHz and that DISH recently proposed including the 2180-2200 MHz AWS-4 band. Given that 1695-1710 MHz will be auctioned and licensed unpaired, we conclude that extending an interoperability requirement to this band at this time would be inappropriate because the downlink band(s) is undetermined. At this time, we also decline DISH’s suggestion to add the AWS-4 downlink band (2180-2200 MHz) into the basic interoperability rule for AWS-3 licensees. The record is not developed on this issue⁷¹² and relevant technical issues have not been fully explored by commenters. Nonetheless, we appreciate the potential public interest benefits of an expansive, interoperable, band extending across most, or possibly all, of the 1.7 GHz uplink band and the 2.1 GHz downlink band. Accordingly, at this juncture, we encourage interested parties to work towards voluntary, standards-based solutions to facilitate interoperability, to the extent technically practical, across all of these AWS-1/3/4 bands. Once AWS-3 is licensed, we expect AWS-3 licensees to participate in good faith in standard setting processes

(Continued from previous page)

“the deployment of advanced services to many rural and underserved areas.” Smith Bagley, MTPCS, and Cellular Network Partnership Joint Reply at 4 quoting USCC Comments at 18.

⁷⁰⁹ “Interoperability will also ‘facilitate roaming arrangements and allow smaller regional carriers to compete with the larger carriers—a result that is in the public interest.’” Smith Bagley, MTPCS, and Cellular Network Partnership Joint Reply at 4 quoting USCC Comments at 24.

⁷¹⁰ See 47 U.S.C. §§ 301, 303(b), 303(g), 303(r). See also *id.* §§ 153(28) (defining “mobile stations”), (42) (defining station license by reference to “use or operation of apparatus”), 153(57) (defining transmission to include “all instrumentalities, facilities, and services incidental” thereto), 154(i). See generally *Lower 700 MHz Interoperability R&O*, 28 FCC Rcd at 15155-56 ¶¶ 69-70 (2013).

⁷¹¹ Amendment of the Commission’s Rules to Establish New Personal Communications Services, RM-7140, RM-7175, RM-7618, GEN Docket No. 90-314, *Memorandum Opinion and Order*, 9 FCC Rcd 4957, 5021-22 ¶¶ 163-64 (1994) (*Broadband PCS Memorandum Opinion and Order*).

⁷¹² Compare, e.g., text accompanying note 704, *supra*. Apart from longstanding, wireless industry-wide advocacy for 1710-1780 MHz paired with 2110-2180 MHz, the record before us reflects among AWS-1/3 interoperability proponents a reciprocal understanding of sorts among potential, future AWS-3 licensees: if licensed in 1755-1780/2155-2180 MHz, each proponent is willing to accept any burden arising from the interoperability requirement that it seeks. On the other hand, DISH’s proposed AWS-1/3/4 interoperability requirement would not apply to any AWS-4 devices. While this lack of reciprocity does not disqualify the proposal, the distinction is a consideration that cannot be ignored.

to extend interoperability across AWS-1/3/4 (1710-1780 MHz and 2110-2200 MHz), unless there are technical impediments to doing so. If technical concerns arise, we expect parties to work to find reasonable measures to remedy those concerns. In the absence of technical impediments to interoperability, if the Commission determines that progress on interoperability has stalled in the standards process, future AWS-3 licensees are hereby on notice that the Commission will consider initiating a rulemaking regarding the extension of an interoperability mandate that includes AWS-4 (2180-2200 MHz) at that time. Should we undertake such a rulemaking, relevant considerations may include considerations of harmful interference, technical cost and difficulty of implementation, and the extent to which licensees are common to both the AWS-3 and AWS-4 bands.

IV. PROCEDURAL MATTERS

A. Ex Parte Presentations

232. We remind interested parties that this proceeding is “permit-but-disclose” proceeding in accordance with the Commission’s *ex parte* rules.⁷¹³ Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter’s written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (e.g., .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission’s *ex parte* rules.

233. As discussed in section III.E (Federal/Non-Federal Coordination) above, in the process of developing one or more joint public notices regarding Federal/non-Federal coordination, NTIA may seek recommendations from the Commerce Spectrum Management Advisory Committee (CSMAC). CSMAC is an advisory committee created for the purpose of advising NTIA on spectrum policy issues. CSMAC consists of private-sector “Special Government Employees” appointed by NTIA to provide advice and recommendations on U.S. spectrum management policy.⁷¹⁴ Commission staff has been present at meetings of the full CSMAC and has participated in CSMAC’s working groups.⁷¹⁵ Commission staff’s participation in these meetings, and the free flow of information during the meetings, is essential to gaining an understanding of the issues implicated in making 1695-1710 MHz and 1755-1780 MHz available for commercial wireless use. While the CSMAC’s meetings are open to the public, the FCC’s *ex parte* requirements could, depending on the particular factual circumstances, be triggered if FCC decision makers are present, and oral or written presentations are made.⁷¹⁶ Similarly, meetings of the

⁷¹³ 47 C.F.R. §§ 1.1200 *et seq.*

⁷¹⁴ See U.S. Department of Commerce, Charter of the Commerce Spectrum Management Advisory Committee (2013), http://www.ntia.doc.gov/files/ntia/publications/csmac_2013_charter.pdf.

⁷¹⁵ See, e.g., Wireless Telecommunications Bureau and Office of Engineering and Technology Exempt Certain Ex Parte Presentations in GN Docket No. 13-185, *Public Notice*, 28 FCC Rcd 12268 (WTB,OET 2013).

⁷¹⁶ 47 C.F.R. § 1.1206.

CSMAC's working groups could, depending on the particular factual circumstances, be subject to the Commission's *ex parte* rules when FCC decision makers are present, if oral or written *ex parte* presentations are made.

234. Therefore, pursuant to our authority under Section 1.1200 of the Commission's rules, we continue the limited exemption in the AWS-3 proceeding (GN Docket No. 13-185) from the *ex parte* disclosure requirements of Section 1.1206 presentations made in formally organized meetings of the CSMAC at which FCC staff is present, and meetings held in connection with CSMAC, including working groups in which FCC staff is a participant.⁷¹⁷ Such presentations will be exempt to the same extent as presentations are exempt under the shared jurisdiction exemption of Section 1.1204(a)(5).⁷¹⁸ We note that this exemption does not change the nature of public CSMAC proceedings; it simply allows FCC staff to participate without triggering disclosure requirements under the Commission's *ex parte* rules.

235. The *AWS-3 Report and Order* discusses matters concerning relocating federal users in 1695-1710 MHz and 1755-1780 MHz, spectrum sharing between commercial and federal users in 1695-1710 MHz and 1755-1780 MHz, and implementation matters related to the Spectrum Relocation Fund and the Public Safety Trust Fund. Discussions regarding these matters, may not be open to the public, and will occur between or among several agencies or branches of the Federal Government. Commission staff is regularly engaged with staff from NTIA, the Department of Defense (DoD), the Office of Management and Budget (OMB), the Office of Science and Technology Policy (OSTP), the Department of Justice (DoJ), the National Oceanic and Atmospheric Administration (NOAA), and other federal agencies and offices for the purpose of coordinating these matters, including but not limited to facilitating commercial use of the 1695-1710 MHz and 1755-1780 MHz bands. In addition, relevant Congressional committees have sought to further facilitate discussion among Federal Government stakeholders. Some of these discussions may already be subject to the Section 1.1204(a)(5) *ex parte* exemption in the Commission's rules, to the extent that they involve a matter over which that agency or branch and the Commission share jurisdiction, while others may not.⁷¹⁹ We believe that these discussions among Federal Government personnel will benefit from an uninhibited flow of information between and among all participants, including potentially sensitive information regarding strategic federal use of these bands.

236. Therefore, pursuant to our authority under Section 1.1200 of the Commission's rules, we exempt from the *ex parte* disclosure requirements of Section 1.1206 presentations regarding the AWS-3 proceeding (GN Docket No. 13-185) made between representatives from the FCC and NTIA, OMB, OSTP, DoD, DoJ, NOAA, other federal offices and agencies, or Congressional committee members and committee staff, to the same extent as presentations are exempt under the shared jurisdiction exemption of Section 1.1204(a)(5).⁷²⁰

237. To the extent that any of the participants in the above-described meetings intends the Commission, with respect to any decision it makes in the AWS-3 proceeding, to rely on an *ex parte* presentation to which we have extended an exemption *herein*, we encourage that party to file the presentation (or, if oral, summary of it) in the record with ample time for other interested parties to the proceeding to review and respond, as appropriate, and for Commission staff to fully analyze and incorporate as necessary into any subsequent Commission decision. In this regard, we advise these participants that, consistent with the limitations of the exemption that we have established herein for the

⁷¹⁷ *Id.* §§ 1.1200, 1.1206.

⁷¹⁸ *See id.* § 1.1204(a)(5). Specifically, the *ex parte* requirements do not apply provided that "any new factual information obtained through such a presentation that is relied on by the Commission in its decision-making process will, if not otherwise submitted for the record, be disclosed by the Commission no later than at the time of the release of the Commission's decision." *Id.*

⁷¹⁹ *See id.*

⁷²⁰ *See id.*; *supra* note 717.

AWS-3 proceeding, in rendering a decision in this proceeding the Commission will not rely on an *ex parte* presentation covered by this exemption unless it is added to the record, at the latest, prior to the release of the decision.

B. Final Regulatory Flexibility Analysis

238. The Regulatory Flexibility Act (RFA)⁷²¹ requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that “the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.”⁷²² Accordingly, we have prepared a Final Regulatory Flexibility Analysis (FRFA) concerning the possible impact of the rule changes contained in the *Report and Order* on small entities. The FRFA is set forth in Appendix B.

C. Paperwork Reduction Act Analysis

239. This document contains modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection requirements contained in this proceeding. In addition, we note that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4), we previously sought specific comment on how the Commission might further reduce the information collection burden for small business concerns with fewer than 25 employees.

240. In this present document, we have assessed the effects of the policies adopted in this Report and Order with regard to information collection burdens on small business concerns, and find that these policies will benefit many companies with fewer than 25 employees because the revisions we adopt should provide small entities with more information, more flexibility, and more options for gaining access to valuable spectrum. In addition, we have described impacts that might affect small businesses, which includes most businesses with fewer than 25 employees, in the FRFA in Appendix B, *infra*.

D. Further Information

241. For additional information on this proceeding, contact Ronald Repasi, Office of Engineering and Technology, at (202) 418-0768 or Ronald.Repasi@fcc.gov or Peter Daronco, Broadband Division, Wireless Telecommunications Bureau, at (202) 418-7235 or Peter.Daronco@fcc.gov.

V. ORDERING CLAUSES

242. ACCORDINGLY, IT IS ORDERED, pursuant to sections 1, 2, 4(i), 201, 301, 302, 303, 307, 308, 309, 310, 316, 319, 324, 332, and 333 of the Communications Act of 1934, as amended, and sections 6003, 6004, and 6401 of the Middle Class Tax Relief Act of 2012, Pub. L. No. 112-96, 126 Stat. 156, 47 U.S.C. §§ 151, 152, 154(i), 201, 301, 302(a), 303, 307, 308, 309, 310, 316, 319, 324, 332, 333, 1403, 1404, and 1451, that this Report and Order IS HEREBY ADOPTED.

243. IT IS FURTHER ORDERED that Parts 1, 2 and 27 of the Commission’s Rules, 47 C.F.R. Parts 1, 2 and 27, ARE AMENDED as specified in Appendix A, effective 30 days after publication in the *Federal Register* except as otherwise provided herein.⁷²³ It is our intention in adopting

⁷²¹ See 5 U.S.C. § 601–612. The RFA has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

⁷²² 5 U.S.C. § 605(b).

⁷²³ The Final Rules that we are adopting in Appendix A also include several non-substantive revisions to the rules as follows: we are moving from 47 C.F.R. § 1.949(c) to 47 C.F.R. § 27.14(q) the criteria for renewal for AWS-4 with one revision (changing “e.g.” to “including” to conform the language to the same rule that we are adopting today for AWS-3. We also make this same, one-word revision to § 27.14(r)(6)(i) for 1915-1920 MHz and 1995-2000 MHz. We delete “total” in § 27.14(r)(1) and correct “areas” to “area” in § 27.14(r)(4). Finally, in 47 C.F.R. § 27.53, we

(continued....)

these rule changes that, if any provision of the rules, or the application thereof to any person or circumstance, are held to be unlawful, the remaining portions of the rules not deemed unlawful, and the application of such rules to other persons or circumstances, shall remain in effect to the fullest extent permitted by law.

244. IT IS FURTHER ORDERED that the amendments, adopted above and specified in the Appendix A, to sections 2.1033(c)(19)(i)-(ii); 27.14(k), (s); 27.17(c); 27.50(d)(3); 27.1131; 27.1132; 27.1134(c), (f) of the Commission's rules, 47 C.F.R. §§ 2.1033(c)(19)(i)-(ii); 27.14(k), (s); 27.17(c); 27.50(d)(3); 27.1131; 27.1132; 27.1134(c), (f), which contain new or modified information collection requirements that require approval by the Office of Management and Budget under the Paperwork Reduction Act, WILL BECOME EFFECTIVE after the Commission publishes a notice in the Federal Register announcing such approval and the relevant effective date.

245. The effective date of the amendment to 47 C.F.R. § 2.106 adding Fixed and Mobile allocations for the 2025-2110 MHz band to the Federal Table of Frequency Allocations WILL BECOME EFFECTIVE after the Commission publishes a notice in the Federal Register announcing the relevant effective date.⁷²⁴

246. IT IS FURTHER ORDERED that the Final Regulatory Flexibility Analysis in Appendix B hereto IS ADOPTED.

247. IT IS FURTHER ORDERED that, pursuant to Section 801(a)(1)(A) of the Congressional Review Act, 5 U.S.C. § 801(a)(1)(A), the Commission SHALL SEND a copy of this *Report and Order* to Congress and to the Government Accountability Office.

248. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Report and Order*, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

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redesignate paragraphs (d) through (m) as paragraphs (e) through (n) and reserve paragraph (d). This revision restores certain technical provisions to longstanding letter assignments that are often cited in equipment certification exhibits. Because of the non-substantive nature of these revisions, notice and comment are unnecessary. 5 U.S.C. § 553(b)(B).

⁷²⁴ See *supra* ¶¶ 211, 215.

APPENDIX A**Final Rules**

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR parts 1, 2 and 27 as follows:

PART 1—PRACTICE AND PROCEDURE

1. The authority citation for part 1 continues to read as follows:

Authority: 15 U.S.C. 79 et seq.; 47 U.S.C. 151, 154(i), 154(j), 155, 157, 225, 227, 303(r), 309, 1403, 1404, and 1451.

2. Section 1.949 is amended by deleting paragraph (c) as follows:

§ 1.949 Application for renewal of license.

Delete paragraph (c).

PART 2 – FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS;**GENERAL RULES AND REGULATIONS**

3. The authority citation for part 2 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

4. Section 2.106, the Table of Frequency Allocations, is amended as follows:

- a. Revise pages 28, 35, and 36.
- b. In the list of United States (US) Footnotes, add footnotes US88, US91, US92, and US289; and remove footnotes US201 and US393.
- c. In the list of non-Federal Government (NG) Footnotes, add footnote NG41 and remove footnotes NG153, NG177, and NG178.
- d. In the list of Federal Government (G) Footnotes, remove footnote G118.

§ 2.106 Table of Frequency Allocations.

The revisions and additions read as follows:

* * * * *

456-459 FIXED MOBILE 5.286AA 5.271 5.287 5.288			456-459 5.287 US64 US288		456-460 FIXED LAND MOBILE 5.287 US64 US288 NG32 NG112 NG124 NG148	Public Mobile (22) Maritime (80) Private Land Mobile (90) MedRadio (95I)
459-460 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460 FIXED MOBILE 5.286AA MOBILE-SATELLITE (Earth-to-space) 5.286A 5.286B 5.286C 5.209	459-460 FIXED MOBILE 5.286AA 5.209 5.271 5.286A 5.286B 5.286C 5.286E	459-460			
460-470 FIXED MOBILE 5.286AA Meteorological-satellite (space-to-Earth)			460-470 Meteorological-satellite (space-to-Earth)		460-462.5375 FIXED LAND MOBILE US209 US289 NG124	Private Land Mobile (90)
					462.5375-462.7375 LAND MOBILE US289	Personal Radio (95)
					462.7375-467.5375 FIXED LAND MOBILE 5.287 US73 US209 US288 US289 NG124	Maritime (80) Private Land Mobile (90)
					467.5375-467.7375 LAND MOBILE 5.287 US288 US289	Maritime (80) Personal Radio (95)
					467.7375-470 FIXED LAND MOBILE 5.287 US73 US209 US288 US289 NG124	Maritime (80) Private Land Mobile (90)
5.287 5.288 5.289 5.290	470-512 BROADCASTING Fixed Mobile 5.292 5.293 512-608 BROADCASTING 5.297 608-614 RADIO ASTRONOMY Mobile-satellite except aeronautical mobile-satellite (Earth-to-space) 614-698 BROADCASTING Fixed Mobile 5.293 5.309 5.311A	470-585 FIXED MOBILE BROADCASTING 5.291 5.298	470-608		470-512 FIXED LAND MOBILE BROADCASTING NG5 NG14 NG66 NG115 NG149	Public Mobile (22) Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H) Private Land Mobile (90)
470-790 BROADCASTING		585-610 FIXED MOBILE BROADCASTING RADIONAVIGATION 5.149 5.305 5.306 5.307			512-608 BROADCASTING NG5 NG14 NG115 NG149	Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H)
		610-890 FIXED MOBILE 5.313A 5.317A BROADCASTING 5.149 5.305 5.306 5.307 5.311A 5.320	608-614 LAND MOBILE (medical telemetry and medical telecommand) RADIO ASTRONOMY US74			Personal Radio (95)
5.149 5.291A 5.294 5.296 5.300 5.302 5.304 5.306 5.311A 5.312			US246 614-698		614-698 BROADCASTING NG5 NG14 NG115 NG149	Broadcast Radio (TV)(73) LPTV, TV Translator/Booster (74G) Low Power Auxiliary (74H)

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Table of Frequency Allocations			1670-2200 MHz (UHF)		Page 35
International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
1670-1675 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.379B 5.341 5.379D 5.379E 5.380A			1670-1675 5.341 US211 US362	1670-1675 FIXED MOBILE except aeronautical mobile 5.341 US211 US362	Wireless Communications (27)
1675-1690 METEOROLOGICAL AIDS FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.341			1675-1695 METEOROLOGICAL AIDS (radiosonde) METEOROLOGICAL-SATELLITE (space-to-Earth) US88 5.341 US211 US289		
1690-1700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) Fixed Mobile except aeronautical mobile 5.289 5.341 5.382	1690-1700 METEOROLOGICAL AIDS METEOROLOGICAL-SATELLITE (space-to-Earth) 5.289 5.341 5.381		1695-1710 METEOROLOGICAL-SATELLITE (space-to-Earth) US88	1695-1710 FIXED MOBILE except aeronautical mobile	Wireless Communications (27)
1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341		1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile 5.289 5.341 5.384	5.341	5.341 US88	
1710-1930 FIXED MOBILE 5.384A 5.388A 5.388B			1710-1761 5.341 US91 US378 US385 1761-1780 SPACE OPERATION (Earth-to-space) G42 US91	1710-1780 FIXED MOBILE 5.341 US91 US378 US385	
			1780-1850 FIXED MOBILE SPACE OPERATION (Earth-to-space) G42	1780-1850	
5.149 5.341 5.385 5.386 5.387 5.388 1930-1970 FIXED MOBILE 5.388A 5.388B 5.388	1930-1970 FIXED MOBILE 5.388A 5.388B Mobile-satellite (Earth-to-space) 5.388	1930-1970 FIXED MOBILE 5.388A 5.388B 5.388	1850-2025	1850-2000 FIXED MOBILE	RF Devices (15) Personal Communications (24) Wireless Communications (27) Fixed Microwave (101)

1970-1980 FIXED MOBILE 5.388A 5.388B 5.388					
1980-2010 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389B 5.389F				2000-2020 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space)	Satellite Communications (25) Wireless Communications (27)
2010-2025 FIXED MOBILE 5.388A 5.388B	2010-2025 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space)	2010-2025 FIXED MOBILE 5.388A 5.388B		2020-2025 FIXED MOBILE	
5.388	5.388 5.389C 5.389E	5.388			
2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space)			2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space) 5.392 US90 US92 US222 US346 US347	2025-2110 FIXED NG118 MOBILE 5.391 5.392 US90 US92 US222 US346 US347	TV Auxiliary Broadcasting (74F) Cable TV Relay (78) Local TV Transmission (101J)
5.392 2110-2120 FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space)			2110-2120	2110-2120 FIXED MOBILE	Public Mobile (22) Wireless Communications (27) Fixed Microwave (101)
5.388			US252	US252	
2120-2170 FIXED MOBILE 5.388A 5.388B	2120-2160 FIXED MOBILE 5.388A 5.388B Mobile-satellite (space-to-Earth) 5.388	2120-2170 FIXED MOBILE 5.388A 5.388B	2120-2200	2120-2180 FIXED MOBILE	
	2160-2170 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth)				
5.388	5.388 5.389C 5.389E	5.388		NG41	
2170-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F				2180-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth)	Satellite Communications (25) Wireless Communications (27)

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UNITED STATES (US) FOOTNOTES

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US88 In the bands 1675-1695 MHz and 1695-1710 MHz, the following provisions shall apply:

(a) Non-Federal use of the band 1695-1710 MHz by the fixed and mobile except aeronautical mobile services is restricted to stations in the Advanced Wireless Service (AWS). Base stations that enable AWS mobile and portable stations to operate in the band 1695-1710 MHz must be successfully coordinated prior to operation as follows: (i) all base stations within the 27 protection zones listed in paragraph (b) that enable mobiles to operate at a maximum e.i.r.p. of 20 dBm, and (ii) nationwide for base stations that enable mobiles to operate with a maximum e.i.r.p. greater than 20 dBm, up to a maximum e.i.r.p. of 30 dBm, unless otherwise specified by Commission rule, order, or notice.

(b) Forty-seven Federal earth stations located within the protection zones listed below operate on a co-equal, primary basis with AWS operations. All other Federal earth stations operate on a secondary basis.

(1) Protection zones for Federal earth stations receiving in the band 1695-1710 MHz:

State	Location	Latitude	Longitude	Radius (km)
AK	Barrow	71° 19' 22"	156° 36' 41"	..... 35
AK	Elmendorf AFB	61° 14' 08"	149° 55' 31"	..... 98
AK	Fairbanks	64° 58' 22"	147° 30' 02"	..... 20
AZ	Yuma	32° 39' 24"	114° 36' 22"	..... 95
CA	Monterey	36° 35' 34"	121° 51' 20"	..... 76
CA	Twenty-Nine Palms...	34° 17' 46"	116° 09' 44"	..... 80
FL	Miami	25° 44' 05"	080° 09' 45"	..... 51
HI	Hickam AFB	21° 19' 18"	157° 57' 30"	..... 28
MD	Suitland	38° 51' 07"	076° 56' 12"	..... 98
MS	Stennis Space Center	30° 21' 23"	089° 36' 41"	..... 57
SD	Sioux Falls	43° 44' 09"	096° 37' 33"	..... 42
VA	Wallops Island	37° 56' 45"	075° 27' 45"	..... 30
GU	Andersen AFB	13° 34' 52"	144° 55' 28"	..... 42

(2) Protection zones for Federal earth stations receiving in the band 1675-1695 MHz:

State	Location	Latitude	Longitude	Radius (km)
CA	Sacramento	38° 35' 50"	121° 32' 34"	..... 55
CO	Boulder	39° 59' 26"	105° 15' 51"	..... 02
ID	Boise	43° 35' 42"	116° 13' 49"	..... 39
IL	Rock Island	41° 31' 04"	090° 33' 46"	..... 19
MO	Kansas City	39° 16' 40"	094° 39' 44"	..... 40
MO	St. Louis	38° 35' 26"	090° 12' 25"	..... 34
MS	Columbus Lake	33° 32' 04"	088° 30' 06"	..... 03
MS	Vicksburg	32° 20' 47"	090° 50' 10"	..... 16
NE	Omaha	41° 20' 56"	095° 57' 34"	..... 30
OH	Cincinnati	39° 06' 10"	084° 30' 35"	..... 32
OK	Norman	35° 10' 52"	097° 26' 21"	..... 03
TN	Knoxville	35° 57' 58"	083° 55' 13"	..... 50
WV	Fairmont	39° 26' 02"	080° 11' 33"	..... 04
PR	Guaynabo	18° 25' 26"	066° 06' 50"	..... 48

NOTE: The coordinates are specified in the conventional manner (North latitude, West longitude), except that the Guam (GU) entry is specified in terms of East longitude.

US91 In the band 1755-1780 MHz, the following provisions shall apply:

(a) Non-Federal use of the band 1755-1780 MHz by the fixed and mobile services is restricted to stations in the Advanced Wireless Service (AWS). Base stations that enable AWS mobile and portable stations to operate in the band 1755-1780 MHz must be successfully coordinated on a nationwide basis prior to operation, unless otherwise specified by Commission rule, order, or notice.

(b) In the band 1755-1780 MHz, the Federal systems listed below operate on a co-equal, primary basis with AWS stations. All other Federal stations in the fixed and mobile services identified in an approved Transition Plan will operate on a primary basis until reaccommodated in accordance with 47 CFR part 301.

(1) Joint Tactical Radio Systems (JTRS) may operate indefinitely at the following locations:

State	Training area	Latitude	Longitude
AZ	Yuma Proving Ground	33° 12' 14"	114° 13' 47"
CA	Fort Irwin	35° 23' 19"	116° 37' 43"
LA	Fort Polk	31° 08' 38"	093° 06' 52"
NC	Fort Bragg (including Camp MacKall)....	35° 09' 04"	078° 59' 13"
NM	White Sands Missile Range.....	32° 52' 50"	106° 23' 10"
TX	Fort Hood	31° 13' 50"	097° 45' 23"

(2) Air combat training system (ACTS) stations may operate on two frequencies within two geographic zones that are defined by the following coordinates:

Geographic Zone	Latitude	Longitude
Polygon 1	41° 52' 00"	117° 49' 00"
	42° 00' 00"	115° 05' 00"
	43° 31' 13"	115° 47' 18"
Polygon 2	47° 29' 00"	111° 22' 00"
	48° 13' 00"	110° 00' 00"
	47° 30' 00"	107° 00' 00"
	44° 11' 00"	103° 06' 00"

NOTE: ACTS transmitters may cause interference to AWS base stations between separation distances of 285 km (minimum) and 415 km (maximum).

(3) In the sub-band 1761-1780 MHz, Federal earth stations in the space operation service (Earth-to-space) may transmit at the following 25 sites and non-Federal base stations must accept harmful interference caused by the operation of these earth stations:

State	Site	Latitude	Longitude
AK	Fairbanks	64° 58' 20"	147° 30' 59"
CA	Camp Parks	37° 43' 51"	121° 52' 50"
CA	Huntington Beach	33° 44' 50"	118° 02' 04"
CA	Laguna Peak	34° 06' 31"	119° 03' 53"
CA	Monterey	36° 35' 42"	121° 52' 28"
CA	Sacramento	38° 39' 59"	121° 23' 33"
CA	Vandenberg AFB	34° 49' 23"	120° 30' 07"
CO	Buckley	39° 42' 55"	104° 46' 29"
CO	Schriever AFB	38° 48' 22"	104° 31' 41"
FL	Cape Canaveral AFS	28° 29' 09"	080° 34' 33"
FL	Cape GA, CCAFB	28° 29' 03"	080° 34' 21"
FL	JIATF-S Key West	24° 32' 36"	081° 48' 17"
HI	Kaena Point, Oahu	21° 33' 43"	158° 14' 31"
MD	Annapolis	38° 59' 27"	076° 29' 25"
MD	Blossom Point	38° 25' 53"	077° 05' 06"
MD	Patuxent River NAS	38° 16' 28"	076° 24' 45"

ME	Prospect Harbor	44° 24' 16"	068° 00' 46"
NC	Ft Bragg	35° 09' 04"	078° 59' 13"
NH	New Boston AFS	42° 56' 46"	071° 37' 44"
NM	Kirtland AFB	34° 59' 06"	106° 30' 28"
TX	Ft Hood	31° 08' 57"	097° 46' 12"
VA	Fort Belvoir	38° 44' 04"	077° 09' 12"
WA	Joint Base Lewis-McChord	47° 06' 11"	122° 33' 11"
GU	Andersen AFB	13° 36' 54"	144° 51' 22"
GU	NAVSOC Det. Charlie	13° 34' 58"	144° 50' 32"

NOTE: The coordinates are specified in the conventional manner (North latitude, West longitude), except that the Guam (GU) entries are specified in terms of East longitude. Use at Cape Canaveral AFS is restricted to launch support only. If required, successfully coordinated with all affected AWS licensees, and authorized by NTIA, reasonable modifications of these grandfathered Federal systems beyond their current authorizations or the addition of new earth station locations may be permitted. The details of the coordination must be filed with NTIA and FCC.

(c) In the band 1755-1780 MHz, the military services may conduct Electronic Warfare (EW) operations on Federal ranges and within associated airspace on a non-interference basis with respect to non-Federal AWS operations and shall not constrain implementation of non-Federal AWS operations. This use is restricted to Research, Development, Test and Evaluation (RDT&E), training, and Large Force Exercise (LFE) operations.

US92 In the band 2025-2110 MHz, Federal use of the co-primary fixed and mobile services is restricted to the military services and the following provisions apply:

(a) Federal use shall not cause harmful interference to, nor constrain the deployment and use of the band by, the Television Broadcast Auxiliary Service, the Cable Television Relay Service, or the Local Television Transmission Service. To facilitate compatible operations, coordination is required in accordance with a Memorandum of Understanding between Federal and non-Federal fixed and mobile operations. Non-Federal licensees shall make all reasonable efforts to accommodate military mobile and fixed operations; however, the use of the band 2025-2110 MHz by the non-Federal fixed and mobile services has priority over military fixed and mobile operations.

(b) Military stations should, to the extent practicable, employ frequency agile technologies and techniques, including the capability to tune to other frequencies and the use of a modular retrofit capability, to facilitate sharing of this band with incumbent Federal and non-Federal operations.

* * * * *

US289 In the bands 460-470 MHz and 1690-1695 MHz, the following provisions shall apply:

(a) In the band 460-470 MHz, space stations in the Earth exploration-satellite service (EESS) may be authorized for space-to-Earth transmissions on a secondary basis with respect to the fixed and mobile services. When operating in the meteorological-satellite service, such stations shall be protected from harmful interference from other EESS applications. The power flux density produced at the Earth's surface by any space station in this band shall not exceed -152 dBW/m²/4 kHz.

(b) In the band 1690-1695 MHz, EESS applications, other than the meteorological-satellite service, may also be used for space-to-Earth transmissions subject to not causing harmful interference to stations operating in accordance with the Table of Frequency Allocations.

* * * * *

NON-FEDERAL GOVERNMENT (NG) FOOTNOTES

* * * * *

NG41 In the band 2120-2180 MHz, the following provisions shall apply to grandfathered stations in the fixed service:

(a) In the sub-band 2160-2162 MHz, authorizations in the Broadband Radio Service (BRS) applied

for after January 16, 1992 shall be granted on a secondary basis to Advanced Wireless Services (AWS). In the band 2150-2162 MHz, all other BRS stations shall operate on a primary basis until December 9, 2021, and may continue to operate on a secondary basis thereafter, unless said facility is relocated in accordance with 47 CFR 27.1250 through 27.1255.

(b) In the sub-band 2160-2180 MHz, fixed stations authorized pursuant to 47 CFR part 101 may continue to operate on a secondary basis to AWS.

* * * * *

5. Section 2.1033 by adding paragraph (c)(19) to read as follows:

§ 2.1033 Application for certification

* * * * *

(c) * * *

(19) Applications for certification of equipment operating under part 27 of this chapter, that a manufacturer is seeking to certify for operation in the

(i) 1755-1780 MHz, 2155-2180 MHz, or both bands shall include a statement indicating compliance with the pairing of 1710-1780 and 2110-2180 MHz specified in § 27.5(h) of this chapter and § 27.75 of this chapter.

(ii) 1695-1710 MHz, 1755-1780 MHz, or both bands shall include a statement indicating compliance with § 27.77 of this chapter.

* * * * *

PART 27—MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

6. The authority citation for part 27 continues to read as follows:

Authority: 47 U.S.C. § 154, 301, 302a, 303, 307, 309, 332, 336, 337, 1403, 1404, and 1451 unless otherwise noted.

7. Section 27.1 is amended by adding paragraphs (b)(11) through (13) to read as follows:

§ 27.1 Basis and Purpose.

* * * * *

(b) * * *

(11) 1695-1710 MHz.

(12) 1755-1780 MHz.

(13) 2155-2180 MHz

8. Section 27.5(h) is amended to read as follows:

§ 27.5 Frequencies

* * * * *

(h) *1710-1755 MHz, 2110-2155 MHz, 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands.* The following frequencies are available for licensing pursuant to this part in the 1710-1755 MHz, 2110-2155 MHz, 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands:

(1) Four paired channel blocks of 10 megahertz each are available for assignment as follows:

Block A: 1710-1720 MHz and 2110-2120 MHz;

Block B: 1720-1730 MHz and 2120-2130 MHz;

Block F: 1745-1755 MHz and 2145-2155 MHz; and

Block J: 1770-1780 MHz and 2170-2180 MHz.

(2) Six paired channel blocks of 5 megahertz each are available for assignment as follows:

Block C: 1730-1735 MHz and 2130-2135 MHz;

Block D: 1735-1740 MHz and 2135-2140 MHz;

Block E: 1740-1745 MHz and 2140-2145 MHz;

Block G: 1755-1760 MHz and 2155-2160 MHz;

Block H: 1760-1765 MHz and 2160-2165 MHz; and

Block I: 1765-1770 MHz and 2165-2170 MHz.

(3) One unpaired block of 5 megahertz and one unpaired block of 10 megahertz each are available for assignment as follows:

Block A1: 1695-1700 MHz

Block B1: 1700-1710 MHz

NOTE TO PARAGRAPH (h): Licenses to operate in the 1695-1710 MHz and 1755-1780 MHz bands are subject to the condition that the licensee must not cause harmful interference to an incumbent Federal entity relocating from these bands under an approved Transition Plan. This condition remains in effect until NTIA terminates the applicable authorization of the incumbent Federal

entity.

9. Section 27.6 is amended by adding paragraph (k) to read as follows:

§ 27.6 Service areas.

* * * * *

(k) 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands. AWS service areas for the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands are as follows:

(1) Service areas for Block G (1755-1760 MHz and 2155-2160 MHz) are based on cellular markets comprising Metropolitan Statistical Areas (MSAs) and Rural Service Areas (RSAs) as defined by Public Notice Report No. CL-92-40 “Common Carrier Public Mobile Services Information, Cellular MSA/RSA Markets and Counties,” dated January 24, 1992, DA 92-109, 7 FCC Rcd 742 (1992), with the following modifications:

(i) The service areas of cellular markets that border the U.S. coastline of the Gulf of Mexico extend 12 nautical miles from the U.S. Gulf coastline.

(ii) The service area of cellular market 306 that comprises the water area of the Gulf of Mexico extends from 12 nautical miles off the U.S. Gulf coast outward into the Gulf.

(2) Service areas for Blocks H (1760-1765 MHz and 2160-2165 MHz), I (1765-1770 MHz and 2165-2170 MHz), J (1770-1780 MHz and 2170-2180 MHz), A1 (1695-1700 MHz) and B1 (1700-1710 MHz) are based on Economic Areas (EAs) as defined in paragraph (a) of this section.

10. Section 27.11(j) is added to read as follows:

§27.11 Initial authorization.

(j) 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz bands.

(1) Initial authorizations for the 1695-1710 MHz band shall be based on the frequency blocks specified in § 27.5(h)(3) of this part and the corresponding service area specified in § 27.6(k)(2) of this part.

(2) Initial authorizations for the 1755-1780 MHz and 2155-2180 MHz shall be based on the paired frequency blocks specified in § 27.5(h)(1),(2) of this part and the corresponding service areas specified in § 27.6(k)(1),(2) of this part.

11. Section 27.13(k) is added to read as follows:

§ 27.13 License Period.

* * * * *

(k) 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands. Authorizations for the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands will have a term not to exceed twelve (12) years from the date of issuance and ten (10) years from the date of any subsequent license renewal.

12. Revise paragraphs (a), (f), (k), (r)(1), (r)(4), and (r)(6)(i), and add paragraphs (q)(7) and (s) to §27.14 to read as follows:

§ 27.14 Construction requirements; Criteria for renewal.

(a) AWS and WCS licensees, with the exception of WCS licensees holding authorizations for Block A in the 698-704 MHz and 728-734 MHz bands, Block B in the 704-710 MHz and 734-740 MHz bands, Block E in the 722-728 MHz band, Block C, C1 or C2 in the 746-757 MHz and 776-787 MHz bands, Block A in the 2305-2310 MHz and 2350-2355 MHz bands, Block B in the 2310-2315 MHz and 2355-2360 MHz bands, Block C in the 2315-2320 MHz band, and Block D in the 2345-2350 MHz band, and with the exception of licensees holding AWS authorizations in the 1915-1920 MHz and 1995-2000 MHz bands, the 2000-2020 MHz and 2180-2200 MHz bands, or 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz bands, must, as a performance requirement, make a showing of “substantial service” in their license area within the prescribed license term set forth in §27.13. “Substantial service” is defined as service which is sound, favorable and substantially above a level of mediocre service which just might minimally warrant renewal. Failure by any licensee to meet this requirement will result in forfeiture of the license and the licensee will be ineligible to regain it.

* * * * *

(f) Comparative renewal proceedings do not apply to WCS licensees holding authorizations for the 698-746 MHz, 747-762 MHz, and 777-792 MHz bands or licensees holding AWS authorizations for the 1915-1920 MHz and 1995-2000 MHz bands or the 2000-2020 MHz and 2180-2200 MHz bands, or the 1695-1710 MHz, or the 1755-1780 MHz and 2155-2180 MHz bands. These licensees must file a renewal application in accordance with the provisions set forth in §1.949 of this chapter.

* * * * *

(k) Licensees holding WCS or AWS authorizations in the spectrum blocks enumerated in paragraphs (g), (h), (i), (q), (r) or (s) of this section, including any licensee that obtained its license pursuant to the procedures set forth in paragraph (j) of this section, shall demonstrate compliance with performance requirements by filing a construction notification with the Commission, within 15 days of the expiration of the applicable benchmark, in accordance with the provisions set forth in §1.946(d) of this chapter. The licensee must certify whether it has met the applicable performance requirements. The licensee must file a description and certification of the areas for which it is providing service. The construction notifications must include electronic coverage maps, supporting technical documentation and any other information as the Wireless Telecommunications Bureau may prescribe by public notice.

* * * * *

(q) * * *

* * * * *

(7) Renewal showing. An applicant for renewal of a geographic-area authorization in the 2000–2020 MHz and 2180–2200 MHz service bands must make a renewal showing, independent of its performance requirements, as a condition of renewal. The showing must include a detailed description of the applicant's provision of service during the entire license period and address:

(i) The level and quality of service provided by the applicant (including the population served, the area served, the number of subscribers, the services offered);

(ii) The date service commenced, whether service was ever interrupted, and the duration of any interruption or outage;

(iii) The extent to which service is provided to rural areas;

(iv) The extent to which service is provided to qualifying tribal land as defined in § 1.2110(f)(3)(i); and

(v) Any other factors associated with the level of service to the public.

(r) * * *

(1) A licensee shall provide signal coverage and offer service within four (4) years from the date

of the initial license to at least forty (40) percent of the population in each of its licensed areas (“Interim Buildout Requirement”).

* * * * *

(4) If a licensee fails to establish that it meets the Final Buildout Requirement for a particular licensed area, its authorization for each license area in which it fails to meet the Final Buildout Requirement shall terminate automatically without Commission action and the licensee will be ineligible to regain it if the Commission makes the license available at a later date.

* * * * *

(6) * * *

(i) The level and quality of service provided by the applicant (including the population served, the area served, the number of subscribers, the services offered);

* * * * *

(s) The following provisions apply to any licensee holding an AWS authorization in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands:

(1) A licensee shall provide reliable signal coverage and offer service within six (6) years from the date of the initial license to at least forty (40) percent of the population in each of its licensed areas (“Interim Buildout Requirement”).

(2) A licensee shall provide reliable signal coverage and offer service within twelve (12) years from the date of the initial license to at least seventy-five (75) percent of the population in each of its licensed areas (“Final Buildout Requirement”).

(3) If a licensee fails to establish that it meets the Interim Buildout Requirement for a particular licensed area, then the Final Buildout Requirement (in this paragraph (s)) and the AWS license term (as set forth in § 27.13(k)) for each license area in which it fails to meet the Interim Buildout Requirement shall be accelerated by two (2) years (from twelve (12) to ten (10) years).

(4) If a licensee fails to establish that it meets the Final Buildout Requirement for a particular licensed area, its authorization for each license area in which it fails to meet the Final Buildout Requirement shall terminate automatically without Commission action and the licensee will be ineligible

to regain it if the Commission makes the license available at a later date.

(5) To demonstrate compliance with these performance requirements, licensees shall use the most recently available U.S. Census Data at the time of measurement and shall base their measurements of population served on areas no larger than the Census Tract level. The population within a specific Census Tract (or other acceptable identifier) will be deemed served by the licensee only if it provides signal coverage to and offers service within the specific Census Tract (or other acceptable identifier). To the extent the Census Tract (or other acceptable identifier) extends beyond the boundaries of a license area, a licensee with authorizations for such areas may include only the population within the Census Tract (or other acceptable identifier) towards meeting the performance requirement of a single, individual license. For the Gulf of Mexico license area, the licensee shall demonstrate compliance with these performance requirements, using off-shore platforms, including production, manifold, compression, pumping and valving platforms as a proxy for population in the Gulf of Mexico.

(6) An applicant for renewal of a license covered by this paragraph (s) must make a renewal showing, independent of its performance requirements, as a condition of each renewal. The showing must include a detailed description of the applicant's provision of service during the entire license period and address:

(i) The level and quality of service provided by the applicant (including the population served, the area served, the number of subscribers, the services offered);

(ii) The date service commenced, whether service was ever interrupted, and the duration of any interruption or outage;

(iii) The extent to which service is provided to rural areas;

(iv) The extent to which service is provided to qualifying tribal land as defined in

§ 1.2110(f)(3)(i) of this chapter; and

(v) Any other factors associated with the level of service to the public.

13. Section 27.15 is amended by revising the first sentences of paragraphs (d)(1)(i), and (d)(2)(i), and paragraphs (d)(1)(iii) and (d)(2)(iii) to read as follows:

§ 27.15 Geographic partitioning and spectrum disaggregation.

* * * * *

(d) * * *

(1) * * *

(i) Except for WCS licensees holding authorizations for Block A in the 698-704 MHz and 728-734 MHz bands, Block B in the 704-710 MHz and 734-740 MHz bands, Block E in the 722-728 MHz band, or Blocks C, C1, and C2 in the 746-757 MHz and 776-787 MHz bands; and for licensees holding AWS authorizations in the 1915-1920 MHz and 1995-2000 MHz bands, the 2000-2020 MHz and 2180-2200 MHz bands; or the 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz bands, the following rules apply to WCS and AWS licensees holding authorizations for purposes of implementing the construction requirements set forth in §27.14. * * *

* * * * *

(iii) For licensees holding AWS authorizations in the 1915-1920 MHz and 1995-2000 MHz bands, or the 2000-2020 MHz and 2180-2200 MHz bands, or the 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz bands, the following rules apply for purposes of implementing the construction requirements set forth in §27.14. Each party to a geographic partitioning must individually meet any service-specific performance requirements (i.e., construction and operation requirements). If a partitioner or partitionee fails to meet any service-specific performance requirements on or before the required date, then the consequences for this failure shall be those enumerated in §27.14(q) for 2000-2020 MHz and 2180-2200 MHz licenses, those enumerated in §27.14(r) for 1915-1920 MHz and 1995-2000 MHz licenses, and those enumerated in § 27.14(s) for 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz licenses.

(2) * * *

(i) Except for WCS licensees holding authorizations for Block A in the 698-704 MHz and 728-734 MHz bands, Block B in the 704-710 MHz and 734-740 MHz bands, Block E in the 722-728 MHz band, or Blocks C, C1, and C2 in the 746-757 MHz and 776-787 MHz bands; and for licensees holding AWS authorizations in the 1915-1920 MHz and 1995-2000 MHz bands, the 2000-2020 MHz and 2180-2200 MHz bands or the 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz bands; the following

rules apply to WCS and AWS licensees holding authorizations for purposes of implementing the construction requirements set forth in §27.14. * * *

* * * * *

(iii) For licensees holding AWS authorizations in the 1915-1920 MHz and 1995-2000 MHz bands, or the 2000-2020 MHz and 2180-2200 MHz bands, or the 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz bands, the following rules apply for purposes of implementing the construction requirements set forth in §27.14. Each party to a spectrum disaggregation must individually meet any service-specific performance requirements (i.e., construction and operation requirements). If a disaggregator or a disaggregatee fails to meet any service-specific performance requirements on or before the required date, then the consequences for this failure shall be those enumerated in §27.14(q) for 2000-2020 MHz and 2180-2200 MHz licenses, those enumerated in §27.14(r) for 1915-1920 MHz and 1995-2000 MHz licenses, and those enumerated in § 27.14(s) for 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz.

14. Section 27.17 is amended to read as follows:

§ 27.17 Discontinuance of service in the 1695-1710 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2155-2180 MHz, and 2180-2200 MHz bands.

(a) Termination of authorization. An AWS authorization in the 1695-1710 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2155-2180 MHz, and 2180-2200 MHz bands will automatically terminate, without specific Commission action, if the licensee permanently discontinues service either during the initial license term or during any subsequent license term, as follows:

(1) after the interim buildout deadline as specified in §27.14(r) or (s), as applicable (where the licensee meets the interim buildout requirement), or after the accelerated final buildout deadline (where the licensee failed to meet the interim buildout requirement).

(2) after the AWS-4 final buildout deadline as specified in §27.14(q)(1) (where the licensee meets the AWS-4 interim buildout requirement), or after the accelerated final buildout deadline specified in § 27.14(q)(3) (where the licensee failed to meet its AWS-4 interim buildout requirement).

(b) For licensees with common carrier or non-common carrier regulatory status that hold AWS authorizations in the 1695-1710 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2155-2180 MHz, and 2180-2200 MHz bands, permanent discontinuance of service is defined as 180 consecutive days during which a licensee does not provide service to at least one subscriber that is not affiliated with, controlled by, or related to the licensee. For licensees with private, internal regulatory status that hold AWS authorizations in the 1695-1710 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2155-2180 MHz, and 2180-2200 MHz bands, permanent discontinuance of service is defined as 180 consecutive days during which a licensee does not operate.

(c) Filing Requirements. A licensee that holds an AWS authorization in the 1695-1710 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2155-2180 MHz, and 2180-2200 MHz bands that permanently discontinues service as defined in this section must notify the Commission of the discontinuance within 10 days by filing FCC Form 601 or 605 requesting license cancellation. An authorization will automatically terminate, without specific Commission action, if service is permanently discontinued as defined in this section, even if a licensee fails to file the required form requesting license cancellation.

15. Section 27.50(d) is amended to read as follows:

§ 27.50 Power limits and duty cycle.

* * * * *

(d) The following power and antenna height requirements apply to stations transmitting in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz and 2180-2200 MHz bands:

(1) The power of each fixed or base station transmitting in the 1995–2000 MHz, 2110–2155 MHz, 2155-2180 MHz or 2180–2200 MHz band and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, is limited to:

(A) an equivalent isotropically radiated power (EIRP) of 3280 watts when transmitting with an emission bandwidth of 1 MHz or less;

(B) an EIRP of 3280 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

(2) The power of each fixed or base station transmitting in the 1995–2000 MHz, the 2110–2155 MHz 2155–2180 MHz band, or 2180–2200 MHz band and situated in any geographic location other than that described in paragraph (d)(1) of this section is limited to:

(A) an equivalent isotropically radiated power (EIRP) of 1640 watts when transmitting with an emission bandwidth of 1 MHz or less;

(B) an EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

(3) A licensee operating a base or fixed station in the 2110–2155 MHz band utilizing a power greater than 1640 watts EIRP and greater than 1640 watts/MHz EIRP must coordinate such operations in advance with all Government and non–Government satellite entities in the 2025–2110 MHz band. A licensee operating a base or fixed station in the 2110–2180 MHz band utilizing power greater than 1640 watts EIRP and greater than 1640 watts/MHz EIRP must be coordinated in advance with the following licensees authorized to operate within 120 kilometers (75 miles) of the base or fixed station operating in this band: all Broadband Radio Service (BRS) licensees authorized under part 27 in the 2155–2160 MHz band and all advanced wireless services (AWS) licensees authorized to operate on adjacent frequency blocks in the 2110–2180 MHz band.

(4) Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band and mobile and portable stations operating in the 1695–1710 MHz and 1755–1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710–1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

* * * * *

16. Section 27.53 is amended to redesignate paragraphs (d) through (m) as paragraphs (e) through (n) and, as redesignated, paragraph (d) is reserved.

17. Section 27.53(h) (as redesignated) is amended to read as follows:

§ 27.53 Emission limits.

* * * * *

(h) *AWS emission limits* —(1) *General protection levels.* Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10} (P)$ dB.

* * * * *

18. Section 27.55(a) is amended to read as follows:

§ 27.55 Power strength limits.

(a) *Field strength limits.* For the following bands, the predicted or measured median field strength at any location on the geographical border of a licensee's service area shall not exceed the value specified unless the adjacent affected service area licensee(s) agree(s) to a different field strength. This value applies to both the initially offered service areas and to partitioned service areas.

(1) 1995-2000 MHz, 2110-2155, 2155-2180, 2180-2200, 2305-2320, and 2345-2360 MHz bands:
47 dBμV/m.

* * * * *

19. Section 27.57(c) is amended to read as follows:

§ 27.57 International coordination.

* * * * *

(c) Operation in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 MHz bands is subject to international agreements with Mexico and Canada.

20. Add § 27.75 to read as follows:

§ 27.75 Basic interoperability requirement.

(a) (1) Mobile and portable stations that operate on any portion of frequencies in the paired 1755-1780 MHz and 2155-2180 MHz band must be capable of operating on all frequencies in the paired 1710-

1780 MHz and 2110-2180 MHz band, using the same air interfaces that the equipment utilizes on any frequencies in the paired 1710-1780 MHz and 2110-2180 MHz band.

(2) Reserved.

(b) The basic interoperability requirement in paragraph (a) does not require a licensee to use any particular industry standard. Devices may also contain functions that are not operational in U.S. Territories.

21. Add § 27.77 to read as follows:

§ 27.77 Restriction on mobile and portable equipment in the 1695-1710 MHz and 1755-1780 MHz bands.

Mobile and portable stations in the 1695-1710 MHz and 1755-1780 MHz bands may operate only when under the control of a base station. Base stations that enable mobile or portable equipment to operate in the 1695-1710 MHz and 1755-1780 MHz band are subject to prior coordination requirements. See § 27.1134 of this part (Protection of Federal Government operations).

22. Subpart L is renamed to read as follows:

Subpart L—1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 2110-2155 MHz, 2155-2180 MHz, 2180-2200 MHz Bands

23. Section 27.1105 is added to read as follows:

§ 27.1105 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz bands subject to competitive bidding.

Mutually exclusive initial applications for 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz band licenses are subject to competitive bidding. The general competitive bidding procedures set forth in 47 CFR part 1, subpart Q will apply unless otherwise provided in this subpart.

24. Section 27.1106 is added to read as follows:

§ 27.1106 Designated Entities in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz bands.

Eligibility for small business provisions:

(a) Small business. (1) A small business is an entity that, together with its affiliates, its controlling interests, the affiliates of its controlling interests, and the entities with which it has an

attributable material relationship, has average gross revenues not exceeding \$40 million for the preceding three (3) years.

(2) A very small business is an entity that, together with its affiliates, its controlling interests, the affiliates of its controlling interests, and the entities with which it has an attributable material relationship, has average gross revenues not exceeding \$15 million for the preceding three (3) years.

(b) Bidding credits. A winning bidder that qualifies as a small business as defined in this section or a consortium of small businesses may use the bidding credit specified in § 1.2110(f)(2)(iii) of this chapter. A winning bidder that qualifies as a very small business as defined in this section or a consortium of very small businesses may use the bidding credit specified in § 1.2110(f)(2)(ii) of this chapter.

25. Section 27.1111 is revised to read as follows:

§27.1111 Relocation of fixed microwave service licensees in the 2110-2150 and 2160-2200 MHz bands.

Part 22, subpart E and part 101, subpart B of this chapter contain provisions governing the relocation of incumbent fixed microwave service licensees in the 2110-2150 MHz and 2160-2200 MHz bands.”

26. Section 27.1131 is amended to read as follows:

§ 27.1131 Protection of part 101 operations.

All AWS licensees, prior to initiating operations from any base or fixed station, must coordinate their frequency usage with co-channel and adjacent-channel incumbent, Part 101 fixed-point-to-point microwave licensees operating in the 2110-2180 MHz band. Coordination shall be conducted in accordance with the provisions of § 24.237 of this chapter.

27. Section 27.1132 is amended to read as follows:

§ 27.1132 Protection of incumbent operations in the 2150-2160/62 MHz band.

All AWS licensees, prior to initiating operations from any base or fixed station in the 2110-2180 MHz band, shall follow the provisions of §27.1255 of this part.

28. Section 27.1134 is amended by revising paragraph (c) and adding paragraph (f) to read as follows:

§ 27.1134 Protection of Federal Government operations.

* * * * *

(c) Protection of Federal operations in the 1675-1710 MHz band.

(1) 27 Protection Zones. Within 27 Protection Zones, prior to operating a base station that enables mobile or portable stations to transmit in the 1695-1710 MHz band, licensees must successfully coordinate such base station operations with Federal Government entities operating meteorological satellite Earth-station receivers in the 1675-1710 MHz band. See 47 C.F.R. § 2.106, US note 88 of this chapter for the 27 Protection Zones and other details.

(2) Operation outside of 27 Protection Zones. Non-Federal operations, for mobile and portable stations operating at a maximum EIRP of 20 dBm, are permitted outside of the protection zones without coordination. All non-Federal operations for mobile and portables operating at a maximum EIRP of greater than 20 dBm and up to 30 dBm must be coordinated nationwide. All such operations may not cause harmful interference to the Federal operations protected in 47 C.F.R. § 2.106, US note 88.

(3) Interference. If protected Federal operations receive harmful interference from AWS operations in the 1695-1710 MHz band, an AWS licensee must, upon notification, modify its operations and/or technical parameters as necessary to eliminate the interference.

(4) Point of contact. AWS licensees in the 1695-1710 MHz band must provide and maintain a point of contact at all times so that immediate contact can be made should interference against protected Federal sites occur.

(5) Coordination procedures. Federal use of the radio spectrum is generally governed by the National Telecommunications and Information Administration (NTIA) while non-Federal use is governed by the Commission. As such, any guidance or details concerning Federal/non-Federal coordination must be issued jointly by NTIA and the Commission. The Commission may jointly issue with NTIA one or more public notices with guidance or details concerning the coordination procedures for the 1695-1710 MHz band.

(6) Requirements for licensees operating in the 1710-1755 MHz band. AWS licensees operating fixed stations in the 1710-1755 MHz band, if notified that such stations are causing interference to

radiosonde receivers operating in the Meteorological Aids Service in the 1675-1700 MHz band or a meteorological-satellite earth receiver operating in the Meteorological-Satellite Service in the 1675-1710 MHz band, shall be required to modify the stations' location and/or technical parameters as necessary to eliminate the interference.

* * * * *

(f) Protection of Federal operations in the 1755-1780 MHz band. The Federal Government operates communications systems in the 1755-1780 MHz band. Certain systems are expected to continue to operate in the band indefinitely. All other operations will be relocating to other frequencies or otherwise cease operations in the 1755-1780 MHz band in accordance with 47 CFR part 301. Until such a time as Federal operations in the 1755-1780 MHz bands vacate this spectrum, AWS licensees shall protect such systems and must accept any interference received from these Federal operations. See 47 C.F.R. § 2.106, US note 91 of this chapter for details. AWS licensees must successfully coordinate proposed operations with all Federal incumbents prior to operation as follows:

(1) Protection Zone(s). A protection zone is established for each Federal operation pursuant to 47 C.F.R. § 2.106, US note 91 of this chapter. Unless otherwise specified in later Commission actions, the default protection zone is nationwide. A base station which enables mobile or portable stations to transmit in the 1755-1780 MHz band may not operate within the Protection Zone(s) of a Federal operation until the licensee successfully coordinates such base station operations with Federal Government entities as follows depending on the type of Federal incumbent authorization:

(i) Federal US&P Assignments: Each AWS licensee must coordinate with each Federal agency that has U.S. and Possessions (US&P) authority prior to its first operations in its licensed area to reach a coordination arrangement with each US&P agency on an operator-to-operator basis. (Agencies with U.S. and Possessions (US&P) authority do not operate nationwide and may be able to share, prior to relocation, in some areas.)

(ii) Other Federal Assignments: Each AWS licensee must successfully coordinate all base station operations within a Protection Zone with the Federal incumbents. The default requirement is a nationwide coordination zone with possible revisions to the Protection Zone and other details to be

announced in a Joint FCC/NTIA public notice.

(2) Interference: If protected Federal operations receive harmful interference from AWS operations in the 1755-1780 MHz band, an AWS licensee must, upon notification, modify its operations and/or technical parameters as necessary to eliminate the interference.

(3) Point of contact. AWS licensees in the 1755-1780 MHz band must provide and maintain a point of contact at all times so that immediate contact can be made should interference against protected Federal operations occur.

(4) Coordination procedures. Federal use of the radio spectrum is generally governed by the National Telecommunications and Information Administration (NTIA) while non-Federal use is governed by the Commission. As such, any guidance or details concerning Federal/non-Federal coordination must be issued jointly by NTIA and the Commission. The Commission may jointly issue with NTIA one or more public notices with guidance or details concerning the coordination procedures for the 1755-1780 MHz band.

APPENDIX B

Final Regulatory Flexibility Act Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),¹ the Commission incorporated an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in the *Notice of Proposed Rulemaking (NPRM)*. No comments were filed addressing the IRFA. Because we amend the rules in this *Report and Order*, we have included this Final Regulatory Flexibility Analysis (FRFA) which conforms to the RFA.²

A. Need for, and Objectives of, the Report and Order

2. Wireless broadband is a critical component of economic growth, job creation, and global competitiveness and consumers are increasingly using wireless broadband services to assist them in their everyday lives.³ The rapid adoption of smartphones and tablet computers, combined with deployment of high-speed 3G and 4G technologies, is driving more intensive use of mobile networks, so much so that the total number of mobile wireless connections now exceeds the total U.S. population.⁴ As of the second quarter of 2013, 64 percent of U.S. mobile subscribers owned smartphones.⁵ It is predicted that by 2019, almost all handsets in North America will be smartphones and that total smartphone traffic over mobile networks will increase 10 times between 2013 and 2019.⁶ As of June 2013, 34 percent of American

¹ See 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. § 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

² See 5 U.S.C. § 604.

³ Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, WT Docket No. 11-186, *Sixteenth Report*, 28 FCC Rcd 3700, 3929-3931 ¶¶ 361-66 (2013) (*Sixteenth Mobile Wireless Competition Report*); *see also* Service Rules for the Advanced Wireless Services H Block—Implementing Section 6401 of the Middle Class Tax Relief and Job Creation Act of 2012 Related to the 1915-1920 MHz and 1995-2000 MHz bands, WT Docket No. 12-357, *Report and Order*, FCC 13-88 28 FCC Rcd 9483, 9484-85 ¶ 2 (2013) (*H Block R&O*); Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands, WT Docket Nos. 12-70, 04-356, ET Docket No. 10-142, *Report and Order and Order of Proposed Modification*, 27 FCC Rcd 16102, 16104 ¶ 3 (2012) (*AWS-4 Service Rules R&O*); Connecting America: The National Broadband Plan at 77-79.

⁴ See CTIA – The Wireless Association® A Wireless Industry Survey Results – December 1985 to December 2012 (estimating 326,475,248 total U.S. subscriber connections as of December 2012), *available at* http://files.ctia.org/pdf/CTIA_Survey_YE_2012_Graphics-FINAL.pdf (last visited March 31, 2014). According to the Bureau of the Census, the combined population of the fifty states, the District of Columbia, and Puerto Rico, as of July 1, 2013, was estimated to be 316.1 million. See U.S. Census Bureau, http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2013_PEPANNRES&prodType=tablev (last visited March 31, 2014).

⁵ Nielsen Newswire, The Nielsen Company, *Smartphone Switch: Three-Fourths of Recent Acquirers Chose Smartphones*, (Sept. 17, 2013) *available at* <http://www.nielsen.com/us/en/newswire/2013/smartphone-switch--three-fourths-of-recent-acquirers-chose-smart.html> Nielsen Newswire, The Nielsen Company, *Two Thirds of New Mobile Buyers Now Opting for Smartphones*, July 12, 2012, *available at* <http://www.nielsen.com/us/en/newswire/2012/two-thirds-of-new-mobile-buyers-now-opting-for-smartphones.html> (last visited March 31, 2014).

⁶ Ericsson Mobility, Ericsson Mobility Report on the Pulse of the Networked Society, Nov. 2013 at 7 and 11 *available at* <http://www.ericsson.com/res/docs/2013/ericsson-mobility-report-november-2013.pdf> (last visited March 31, 2014).

adults owned a tablet computer device, an increase from only 18 percent in September 2010.⁷ Tablets generated on average approximately 2.6 times the amount of mobile traffic as the average smartphone in 2013.⁸ All of these trends are resulting in more demand for network capacity and for capital to invest in the infrastructure, technology, and spectrum to support this capacity.⁹ The demand for spectrum, moreover, is expected to continue increasing.¹⁰ In response, both Congress and the President have issued directives to make available additional spectrum for flexible uses, including mobile broadband. The Commission continues to work to make available additional licensed and unlicensed spectrum to meet this growing demand.¹¹

3. In this *Report and Order*, we increase the Nation's supply of spectrum for mobile broadband by adopting rules for fixed and mobile services, including Advanced Wireless Services ("AWS") in the 1695-1710 MHz, 1755-1780 MHz and 2155-2180 MHz bands, some of which were previously allocated exclusively for Federal government use. We refer to these bands collectively as "AWS-3." These service rules will make available 65 megahertz of spectrum for flexible use in accordance with the Spectrum Act. Specifically, we adopt service, technical, and licensing rules that will encourage innovation and investment in mobile broadband and provide certainty and a stable regulatory regime in which broadband deployment can rapidly occur. For example, we find the spectrum is properly allocated for commercial use as the Spectrum Act requires, and authorize mobile operations in the 1695-1710 MHz and 1755-1780 MHz bands and base and fixed operations in the 2155-2180 MHz band.¹² We also adopt service, technical, assignment, and licensing rules for this spectrum that generally follow the Commission's Part 27 rules that govern flexible use terrestrial wireless service—except that in order to protect incumbents that remain in these bands, our rules are more stringent in certain respects. For example, to protect certain Federal operations in the 1695-1710 MHz and 1755-1780 MHz bands from harmful interference, we adopt technical rules that require AWS-3 licensees using these frequencies to

⁷ See Kathryn Zickuhr, Pew Internet & American Life Project, "Tablet Ownership 2013" (June 10, 2013), available at <http://pewinternet.org/Reports/2013/Tablet-Ownership-2013.aspx> (last visited Sept. 5, 2013).

⁸ See Cisco White Paper, *Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2013-2018* http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-520862.pdf at 2 Feb. 5, 2014 (*Global Mobile Data Traffic Forecast*) (last visited Feb. 6, 2014).

⁹ See CTIA Semi-Annual Data Survey Results (detailing growth in cumulative capital investment and cell sites).

¹⁰ The Council of Economic Advisors has found that "the spectrum currently allocated to wireless is not sufficient to handle the projected growth in demand, even with technological improvements allowing for more efficient use of existing spectrum and significant investment in new facilities." Council of Economic Advisors, *The Economic Benefits of New Spectrum for Wireless Broadband* at 5 (Feb. 21, 2012), available at <http://www.whitehouse.gov/administration/eop/cea/factsheets-reports> (last visited June 20, 2013).

¹¹ See, e.g., *H Block R&O*; Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions, GN Docket No. 12-268, *Notice of Proposed Rulemaking*, 27 FCC Rcd 12357 (2012) (*Incentive Auctions NPRM*) (proposing to hold the world's first incentive auction of repurposed television broadcast spectrum); *AWS-4 Service Rules R&O*, 27 FCC Rcd 16102 (making 40 megahertz of spectrum available for mobile broadband); Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band; Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, WT Docket No. 07-293, IB Docket No. 95-91, *Order on Reconsideration*, FCC 12-130, 27 FCC Rcd 13651 (2012) (acting to free up 30 megahertz of spectrum for mobile broadband); Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, GN Docket No. 12-354, *Notice of Proposed Rulemaking and Order*, 27 FCC Rcd 15594 (2012) (pursuing opportunities for innovative sharing use of small cells in 100 megahertz of spectrum in the 3.5 GHz band); Revision of Part 15 of the Commission's Rules to Permit Unlicensed National Information Infrastructure (U-NII) Devices in the 5 GHz Band, ET Docket No. 13-49, *Notice of Proposed Rulemaking*, 28 FCC Rcd 1769 (2013) (examining the potential to free up 195 megahertz of spectrum in the 5 GHz band suitable for "Gigabit Wi-Fi").

¹² See *AWS-3 Report and Order*, section III.A (Bands for AWS-3).

coordinate their proposed operations with NTIA prior to commencing operations.¹³ The market-oriented licensing framework for these bands will ensure efficient spectrum utilization and will foster the development of new and innovative technologies and services, as well as encourage the growth and development of broadband services, ultimately leading to greater benefits to consumers.¹⁴

4. A portion of the proceeds from the auction of Federal spectrum will be used to cover the relocation and sharing costs of Federal incumbents associated with relocating their spectrum-dependent systems from spectrum bands authorized to be auctioned under the Commission's competitive bidding authority.¹⁵ A portion will also be made available for use by the First Responder Network Authority (FirstNet) to carry out its duties and responsibilities, among other things, to deploy and operate a nationwide public safety broadband network.¹⁶

B. Legal Basis

5. The actions taken are authorized pursuant to sections 1, 2, 4(i), 201, 301, 302, 303, 307, 308, 309, 310, 316, 319, 324, 332, and 333 of the Communications Act of 1934, as amended, and Title VI of the Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 1122-96, 126 Stat. 156, 47 U.S.C. §§ 151, 152, 154(i), 201, 301, 302a, 303, 307, 308, 309, 310, 316, 319, 324, 332, 333, 1403, 1404, and 1451.

C. Description and Estimate of the Number of Small Entities to Which the Rules Will Apply

6. The RFA directs agencies to provide a description of, and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules and policies, if adopted.¹⁷ The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."¹⁸ In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.¹⁹ A "small business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.²⁰

7. *Small Businesses, Small Organizations, and Small Governmental Jurisdictions.* Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards that encompass entities that could be directly affected by the proposals under consideration.²¹ As of 2010, there were 27.9 million small businesses in the United States, according to the SBA.²² Additionally, a "small

¹³ See, *AWS-3 Report and Order*, section III.E (Federal/Non-Federal Coordination).

¹⁴ See, *AWS-3 Report and Order*, III.C (Licensing and Operating Rules; Regulatory Issues).

¹⁵ Pub. L. No. 108-494, 118 Stat. 3986, 3991 (2004), codified at 47 U.S.C. §§ 309(j), 923(g), 928.

¹⁶ *Id.* § 6401(c)(3), 6413(b)(3), codified at 47 U.S.C. §§ 309(j)(8)(D)(ii), 1457(b)(3).

¹⁷ 5 U.S.C. § 603(b)(3).

¹⁸ *Id.* § 601(6).

¹⁹ *Id.* § 601(3) (incorporating by reference the definition of "small-business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." *Id.*

²⁰ 15 U.S.C. § 632.

²¹ See 5 U.S.C. § 601(3)–(6).

²² See Small Business Administration, Office of Advocacy, "Frequently Asked Questions," available at http://www.sba.gov/sites/default/files/FAQ_Sept_2012.pdf (last visited Jun. 6, 2013).

organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”²³ Nationwide, as of 2007, there were approximately 1,621,315 small organizations.²⁴ Finally, the term “small governmental jurisdiction” is defined generally as “governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.”²⁵ Census Bureau data for 2007 indicate that there were 89,527 governmental jurisdictions in the United States.²⁶ We estimate that, of this total, as many as 88,761 entities may qualify as “small governmental jurisdictions.”²⁷ Thus, we estimate that most governmental jurisdictions are small.

8. *Wireless Telecommunications Carriers (except satellite).* This industry comprises establishments engaged in operating and maintaining switching and transmission facilities to provide communications via the airwaves. Establishments in this industry have spectrum licenses and provide services using that spectrum, such as cellular phone services, paging services, wireless Internet access, and wireless video services.²⁸ The appropriate size standard under SBA rules is for the category Wireless Telecommunications Carriers. The size standard for that category is that a business is small if it has 1,500 or fewer employees.²⁹ For this category, census data for 2007 show that there were 11,163 establishments that operated for the entire year.³⁰ Of this total, 10,791 establishments had employment of 999 or fewer employees and 372 had employment of 1000 employees or more.³¹ Thus under this category and the associated small business size standard, the Commission estimates that the majority of wireless telecommunications carriers (except satellite) are small entities that may be affected by our proposed action.³² Similarly, according to Commission data, 413 carriers reported that they were engaged in the provision of wireless telephony, including cellular service, PCS, and Specialized Mobile Radio (SMR) Telephony services.³³ Of these, an estimated 261 have 1,500 or fewer employees and 152 have more than

²³ 5 U.S.C. § 601(4).

²⁴ INDEPENDENT SECTOR, THE NEW NONPROFIT ALMANAC & DESK REFERENCE (2010).

²⁵ 5 U.S.C. § 601(5).

²⁶ U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES: 2011, Table 427 (2007).

²⁷ The 2007 U.S. Census data for small governmental organizations are not presented based on the size of the population in each such organization. There were 89,476 local governmental organizations in 2007. If we assume that county, municipal, township, and school district organizations are more likely than larger governmental organizations to have populations of 50,000 or less, the total of these organizations is 52,095. As a basis of estimating how many of these 89,476 local government organizations were small, in 2011, we note that there were a total of 715 cities and towns (incorporated places and minor civil divisions) with populations over 50,000. CITY AND TOWNS TOTALS: VINTAGE 2011 – U.S. Census Bureau, *available at* <http://www.census.gov/popest/data/cities/totals/2011/index.html>. If we subtract the 715 cities and towns that meet or exceed the 50,000 population threshold, we conclude that approximately 88,761 are small. U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES 2011, Tables 427, 426 (Data cited therein are from 2007).

²⁸ <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517210&search=2007%20NAICS%20Search>.

²⁹ 13 C.F.R. § 121.201, NAICS code 517210.

³⁰ U.S. Census Bureau, Subject Series: Information, Table 5, “Establishment and Firm Size: Employment Size of Firms for the United States: 2007 NAICS Code 517210” (issued Nov. 2010).

³¹ See

http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ2&prodType=table. Available census data do not provide a more precise estimate of the number of firms that have employment of 1,500 or fewer employees; the largest category provided is for firms with “100 employees or more.”

³² http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_51SSSZ2&prodType=table.

³³ See *Trends in Telephone Service* at Table 5.3.

1,500 employees.³⁴ Consequently, the Commission estimates that approximately half or more of these firms can be considered small. Thus, using available data, we estimate that the majority of wireless firms can be considered small.

D. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements

9. The projected reporting, recordkeeping, and other compliance requirements resulting from the *Report and Order* will apply to all entities in the same manner. The Commission believes that applying the same rules equally to all entities in this context promotes fairness. The Commission does not believe that the costs and/or administrative burdens associated with the rules will unduly burden small entities, as discussed below. The revisions the Commission adopts should benefit small entities by giving them more information, more flexibility, and more options for gaining access to valuable wireless spectrum.

10. Any applicants for AWS-3 licenses will be required to file license applications using the Commission's automated Universal Licensing System (ULS). ULS is an online electronic filing system that also serves as a powerful information tool, one that enables potential licensees to research applications, licenses, and antenna structures. It also keeps the public informed with weekly public notices, FCC rulemakings, processing utilities, and a telecommunications glossary. AWS-3 licensees that must submit long-form license applications must do so through ULS using Form 601,³⁵ FCC Ownership Disclosure Information for the Wireless Telecommunications Services using FCC Form 602,³⁶ and other appropriate forms.³⁷

E. Steps taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

11. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.³⁸

12. As set forth in this *Report and Order*, we will license the AWS-3 bands under a hybrid of Economic Area (EA) and Cellular Market Area (CMA) geographic licenses.³⁹ Licensing some spectrum blocks on an EA basis best balances the Commission's goals of encouraging the offering of broadband service both to broad geographic areas and to sizeable populations, while licensing one block by CMA will enable smaller carriers to serve smaller, less dense population areas that more closely fit their smaller footprints. Licensees may also adjust their geographic coverage through secondary markets. These rules should enable licensees of AWS-3 spectrum, or any entities providing service in other AWS bands, whether large or small, to more easily adjust their spectrum holdings to build their networks pursuant to individual business plans. As a result, we believe the ability of licensees to adjust spectrum holdings will provide an economic benefit by making it easier for small entities to acquire spectrum or access spectrum in these bands.

³⁴ See *id.*

³⁵ 47 C.F.R. § 1.913(a)(1).

³⁶ *Id.* § 1.919.

³⁷ *Id.* § 1.2107.

³⁸ 5 U.S.C. § 604(a)(6).

³⁹ See *AWS-3 Report and Order*, ¶¶ 20, 48-49.

13. This *Report and Order* adopts rules to protect licensees operating in nearby spectrum bands from harmful interference, which may include small entities. The technical rules adopted in the *Report and Order* are based on the rules for AWS-1 spectrum,⁴⁰ with specific additions or modifications designed, among other things, to protect Federal incumbents and Broadband Radio Service licensees that will share some of the AWS-3 spectrum.⁴¹ The technical rules in the *Report and Order* will therefore allow licensees of the AWS-3 spectrum to operate while also protecting licensees in nearby spectrum from harmful interference, some of whom may be small entities, and meet the statutory requirements of the Spectrum Act. In response to comments to the *AWS-3 NPRM* urging that an interoperability requirement is necessary to prevent the large national carriers from leaving certain AWS-3 spectrum blocks “orphaned” (not included in voluntary industry standards) for small and regional carriers that lack sufficient market power to drive device development,⁴² the *Report and Order* also adopts a requirement that mobile and portable stations that operate on any portion of frequencies in the paired 1755-1780 MHz and 2155-2180 MHz band must be capable of operating on all frequencies in the paired 1710-1780 MHz and 2110-2180 MHz band, using the same air interfaces that the equipment utilizes on any frequencies in the paired 1710-1780 MHz and 2110-2180 MHz band.⁴³ In response to comments seeking smaller spectrum block sizes and license areas (including from commenters that may be or may represent small entities), the Commission is licensing adopted several 5 megahertz spectrum blocks and one 5 megahertz paired block will be licensed by CMAs.⁴⁴

14. The *Report and Order* provides AWS-3 licensees with the flexibility to provide any fixed or mobile service that is consistent with the allocations for this spectrum, which is consistent with other spectrum allocated or designated for licensed fixed and mobile services, e.g., AWS-1.⁴⁵ The *Report and Order* further provides for licensing of this spectrum under the Commission’s market-oriented Part 27 rules.⁴⁶ This includes applying the Commission’s secondary market policies and rules to all transactions involving the use of AWS-3 bands, which will provide greater predictability and regulatory parity with bands licensed for mobile broadband service. These rules should make it easier for AWS-3 providers to enter secondary market arrangements involving use of their spectrum. The secondary market rules apply equally to all entities, whether small or large. As a result, we believe that this will provide an economic benefit to small entities by making it easier for entities, whether large or small, to enter into secondary market arrangements for AWS-3 spectrum.

15. The *Report and Order* adopts rules pertaining to how the AWS-3 licenses will be assigned, including rules to assist small entities in competitive bidding.⁴⁷ Specifically, small businesses will have available a bidding credit of 15 percent and very small businesses a bidding credit of 25 percent. Providing small businesses and very small businesses with bidding credits will provide an economic benefit to small entities by making it easier for small entities to acquire spectrum or access to spectrum in these bands.

⁴⁰ See, e.g., 47 C.F.R. §§ 27.50-53.

⁴¹ See *AWS-3 Report and Order*, ¶¶ 79 (prohibiting fixed stations in the AWS-3 uplink bands), 90 (establishing Protection Zones around certain Federal station locations), 97 (requiring coordination with co-channel BRS stations), 100 (requiring that uplink devices be associated with or under the control of a base station), and 217-225 (requiring coordination with co-channel Federal incumbents).

⁴² See *id.*, ¶ 225.

⁴³ See *id.*, ¶ 229.

⁴⁴ See *id.*, section III.A (Bands for AWS-3).

⁴⁵ See *id.*, ¶ 112.

⁴⁶ See, e.g., 47 C.F.R. §§ 27.1 *et seq.*

⁴⁷ See *AWS-3 Report and Order*, ¶¶ 176-189.

F. Federal Rules that May Duplicate, Overlap, or Conflict with the Rules

16. None.

G. Report to Congress

17. The Commission will send a copy of the *Report and Order*, including this FRFA, in a report to Congress pursuant to the Congressional Review Act.⁴⁸ In addition, the Commission will send a copy the *Report and Order*, including FRFA, to the Chief Counsel for Advocacy of the Small Business Administration. A copy of this *Report and Order* and FRFA (or summaries thereof) will be published in the Federal Register.⁴⁹

⁴⁸ See 5 U.S.C. § 801(a)(1)(A). The Congressional Review Act is contained in Title II, § 251, of the CWAAA, see Pub. L. No. 104-121, Title II, § 251, 110 Stat. 868.

⁴⁹ See 5 U.S.C. § 604(b).

APPENDIX C**Commenters to *AWS-3 NPRM***

4G Americas
Aerospace and Flight Test Radio Coordinating Council (AFTRCC)
Aerospace Industries Association
Atlantic Seawinds Communications, LLC
AT&T Services, Inc.
Bluegrass Cellular, Inc.
Cohen, Dippell and Everist, P.C.
Competitive Carriers Association
Comsearch
CTIA-The Wireless Association
EIBASS
Ericsson
GoGo, Inc.
GPS Innovation Alliance
Hearing Industries Association
Maneesh Pangasa
Mobile Future
Motorola Mobility LLC
National Association of Broadcasters (NAB)
National Telecommunications and Information Administration (NTIA)
Nokia Solutions and Networks
Oceus Networks
Philips Healthcare
Public Service Wireless Services, Inc.
Raytheon Company
Rural Wireless Association, Inc.
Telecommunications Industry Association
Telecommunications Industry Association
The Boeing Company
T-Mobile USA, Inc.
United States Cellular Corporation
Verizon Wireless
xG Technology, Inc.

Reply Commenters to *AWS-3 NPRM*

AT&T Services, Inc.
Blooston Rural Carriers
Carolina West Wireless
Competitive Carriers Association, et al
Consumer Electronics Association
CTIA-The Wireless Association
DISH Network Corporation
GPS Innovation Alliance
Motorola Mobility LLC
National Association of Broadcasters (NAB)
NTCA-The Rural Broadband Association
NTCH, Inc.

Oceus Networks
Raytheon Company
Rural Wireless Association, Inc.
Smith Bagley, Inc., MTPCS, LLC d/b/a Cellular One and Cellular Network Partners d/b/a Pioneer Cellular
Sprint Corporation
The Boeing Company
T-Mobile USA, Inc.
United States Cellular Corporation
Verizon Wireless

Ex Parte filers to AWS-3 NPRM

AT&T Services, Inc.
Carolina West Wireless
Competitive Carriers Association
Council Tree Investors, Inc., McBride Spectrum Partners et al.
CTIA-The Wireless Association
DISH Network Corporation
EIBASS
Grain Management, LLC
Minority Media & Telecom Council
Mobile Future
New America Foundation
New Cell, Inc, d/b/a Cellcom
NTELOS Holdings Corporation
Oceus Networks
Public KnowledgeSandhill Communications, LLC
TerraStar Corporation
Texas 10 d/b/as Cellular One and Central Louisiana Cellular d/b/a Cellular One
T-Mobile USA, Inc.
United States Cellular Corporation
Verizon

**STATEMENT OF
CHAIRMAN THOMAS E. WHEELER**

Re: *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, GN Docket No. 13-185

Everyone at the Commission is ready for this winter to be over. With today's agenda, the Commission officially declares that winter is over and the Spring of Spectrum has begun, which is at least as important as opening day of the baseball season!

Thanks to years of effort by people from across this building and across the federal government and industry, the spectrum pipeline is reopening.

We recently completed our first auction of mobile broadband spectrum since 2008. Our H-Block auction made 10 megahertz of spectrum available, and raised \$1.56 billion in the process, a significant down payment on FirstNet.

This Report and Order establishing service rules for AWS-3 moves us closer to holding an auction for 65 megahertz of spectrum this Fall, the most since the 700 MHz auction in 2008. Even a year ago, no one was sure we'd come to this day. And while there may be disagreements about some of the details around the edges, make no mistake, making this spectrum available for auction for commercial use is a home run no matter how you look at it.

The new capacity will expand the workhorse AWS-1 commercial wireless band to enable faster wireless speeds and more capacity to help satisfy consumers' voracious appetite for mobile data.

This proceeding represents a step forward in spectrum policy. Some of the spectrum being auctioned is already available in the Commission's inventory. But 40 megahertz of the spectrum to be auctioned is used nearly exclusively by federal agencies today.

A long and unprecedentedly candid and purpose-driven discussion among federal and commercial users about how to enhance spectrum efficiency through both clearing and sharing has brought us to this point. I commend NTIA, DOD, DOJ, the White House, and committees on Capitol Hill for their leadership in enabling commercial use of the 1755-1780 MHz band. I also commend NOAA for spearheading the effort to make the 1695-1710 MHz band available for commercial use.

Today is a big step in the process that will lead to the AWS-3 auction this Fall. Make no mistake about it, however, we, together with our Executive Branch colleagues, need to organize a fast process to finalize the technical details that must be resolved before this auction can take place. The clock is ticking. We pledge the full support and commitment of the FCC to this important effort. We all are working against a shot clock without much time on it.

Making these airwaves available for flexible, commercial use is not natural for incumbent spectrum holders. We appreciate their willingness to find solutions to accomplish that goal, however, we are mindful that protection zones and coordination are still issues being debated. As a result, the Order defaults to nationwide coordination zones that no one (including the DoD) feels is an adequate solution.

In other words, there is more work to be done to ensure the success of this auction.

I expect our efforts will result in a pre-auction Public Notice that sets out the rules of the road for new entrants in the band and provides greater certainty to incumbents. We expect we will be able to tailor the coordination zones and procedures to meet the expectations of stakeholders coming out of last year's CSMAC discussions.

As usual, we will also seek comment on auction rules and procedures for the future AWS-3 auction.

And finally, we are working with federal partners to release additional information to inform bidders in the forthcoming auction, recognizing that we also have to protect sensitive information about

federal systems for national security reasons.

Working together, as we have already on this item, we will get this right and free up significant amounts of spectrum.

Thank you to the Wireless Bureau and to the Office of Engineering and Technology for your leadership on this important item. And I want to particularly thank John Leibovitz and Julie Knapp, who have personally worked tirelessly on these issues for several years.

**STATEMENT OF
COMMISSIONER MIGNON L. CLYBURN**

Re: *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, GN Docket No. 13-185

With this Order, the Commission expedites the allocation of flexible use spectrum so wireless providers can better satisfy the ever increasing consumer demand for mobile broadband services. The initiative to pair the 1755 to 1780 and 2155 to 2180 bands has been a painstaking effort involving the wireless industry, federal agencies, and NAB that has spanned several years. But there is nothing like a federal statute with a tight deadline for licensing spectrum to encourage parties to reassess what really matters, find common ground, and do the right thing for the American public. I commend all relevant stakeholders who helped us reach this point.

My review of the policy decisions, in this Order, begins with the trends we are seeing in the mobile wireless market. Each year, the percentage of American adults who are cutting the cord and relying solely on mobile is increasing. For those living below the poverty line, the figure is now at 56 percent, and robust competition is the best way to provide them with affordable choices. But consolidation, secondary market transactions, and difficult investment markets have substantially reduced the number of competitive options for consumers. For example, in the 2006 AWS-1 auction, 104 bidders won 1,087 licenses. Now, four carriers hold 1,000 of those licenses. After carefully considering all the arguments on the band plan, I was more persuaded by the view that smaller block sizes and license areas could enhance competition, and yes, I would have preferred a different band plan.

However, the effort to repurpose federal spectrum for commercial use requires compromise and, in addition to promoting competition, we must consider other policy goals including the fact that the Commercial Spectrum Enhancement Act requires us to design an auction, which returns 110 percent of the total estimated relocation costs of federal users. Since future efforts to repurpose spectrum will involve more difficult policy issues, compromise will become increasingly important going forward. I appreciate Chairman Wheeler's decision to propose an alternative plan that better addresses the concerns of smaller carriers.

I am also pleased that the Order mandates interoperability between the AWS-1 and AWS-3 bands. In the 2013 Notice of Proposed Rulemaking, we explained that the proposed AWS-3 bands are immediately adjacent to the AWS-1 bands, that we are proposing technical rules for uplink and downlink operations in the AWS-3 band that are consistent with those operations in the AWS-1 band,¹ agreed with T-Mobile that "the creation of an additional AWS allocation immediately adjacent to the current AWS-1 allocation will allow for more immediate equipment development and deployment," and tentatively concluded "that having additional spectrum that is adjacent to that used for like services will promote efficiency in broadband deployment."² We sought comment on proposed technical rules, our tentative conclusions, the competitive effects of our proposed rules, and asked commenters to address any other rules not specifically identified in the Notice.³

In response, several parties supported this proposal for a number of reasons, including that consistent technical rules would facilitate use of the AWS-3 spectrum and interoperability across these AWS bands. Some of these parties specifically asked the Commission to adopt a requirement that devices manufactured for the AWS-3 band be interoperable with the AWS-1 band. I agree with those

¹ See Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands, WT Docket No. 13-185, *Notice of Proposed Rulemaking and Order on Reconsideration*, 28 FCC Rcd 11479, 11495 ¶ 30, 11496 ¶ 33 (2013) (AWS-3 NPRM).

² *Id.* at 11495 ¶ 30.

³ *Id.* at 11517 ¶ 85.

who contend that an interoperability requirement would promote timely access to mobile devices across these bands and prevent the difficult situation smaller carriers are experiencing in the lower 700 MHz bands, which we auctioned in 2008. I am also pleased that the Order has strong language promoting a voluntary solution that would extend interoperability to the AWS-4 band. For these reasons, I am voting to approve today's Order.

I want to acknowledge Roger Sherman, Ruth Milkman, Julie Knapp, and all former Wireless Bureau and OET Chiefs, whose efforts over the years are finally coming to fruition. I also want to acknowledge my wireless advisor, Louis Peraertz, for his wise counsel. To those who were involved in negotiating with federal agencies and crafting the important service and technical rules in this Order – well done. As the Order makes clear, more work is necessary before we can auction and license this spectrum; so no rest for the weary. In addition to setting auctions procedures, we should also give the public as much information as possible about geographic areas that will require coordination with federal operations. I know you will approach those tasks with the same diligence and skill that you have shown so far. Thank you.

**STATEMENT OF
COMMISSIONER JESSICA ROSENWORCEL**

Re: *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, GN Docket No. 13-185

This is a big deal.

It was 2008 the last time the Commission conducted an auction this significant. Think about that. Our last major auction was conducted when the iPhone was in its infancy. We were giddy over our ability to tap on a screen—any screen—and expect an Internet-enabled response based on the swipe of a finger. Before streaming video in our palms and laps had become commonplace. Before the applications economy grew to provide over 750,000 jobs. It was a long time ago.

But in the intervening years we were not asleep at the switch. Congress took steps to clear spectrum used by federal authorities and directed this agency to put it to new commercial use. So as a result of their efforts in the Middle Class Tax Relief and Job Creation Act, we can sit here today and tee up an auction of 65 megahertz of prime spectrum.

Our auctions, however, do not take place in a vacuum. Even after all the bids are in, after all the winners are decided, there is a lot of work to do before consumers see the benefits. So it is worth noting that our efforts today are designed to speed this along. Through interoperability requirements, we are lowering the barriers to developing equipment for this new spectrum. By encouraging broader interoperability with the 2180-2200 MHz band, we are facilitating the deployment of an additional 40 megahertz of spectrum. This is good stuff—designed to make it possible to put the benefits of these airwaves in the hands of consumers in ways that are faster, smarter, and sooner.

But the promise of this proceeding goes even further. Because if we get this right, we will also substantially fund the first nationwide, interoperable, wireless broadband network for public safety—the First Responders Network Authority—even before we begin our upcoming spectrum incentive auction. This is important. It means we can finally deliver on the promise of the 9/11 Commission recommendations and give our public safety officials a start on the network they need to keep us safe. Moreover, funding this network through these auctions now will free the Commission to develop more robust incentives in our incentive auction later.

So there is a lot here to celebrate. But as far as we have come, we also need to keep an eye on where we are going next. Because the demand for spectrum since we last held a major auction has skyrocketed—and it shows no signs of stopping. Yet freeing the next swath of federal airwaves will not come easy.

We can, of course, continue on our current course. When commercial wireless demands rise, we can ask Congress to go to our federal partners and press them to find new ways to repurpose old airwaves for new commercial use. But as everyone of us involved in this proceeding knows all too well, our three-step process—clearing federal users, relocating them, and then auctioning the cleared spectrum for new use—is growing creaky. It takes far too long.

That is why it is time for a fresh approach to federal spectrum. We need a policy built on carrots, not sticks. We need to develop a series of incentives to serve as the catalyst for freeing more federal spectrum for commercial use.

Across the board, we need to find ways to reward federal authorities for efficient use of their spectrum. They could be straightforward and financial—under which a certain portion of the revenue from the commercial auction of their previously held spectrum would be reserved for the federal entity releasing the spectrum. They also could involve revenue opportunities from leasing or shared access, including during a period of transition to cleared rights. As part of this effort, we should consider a valuation of all spectrum used by federal authorities in order to provide a consistent way to reward efficiency. In short, we will make smarter use of a scarce resource if federal authorities see benefit in

commercial reallocation—rather than just loss.

The good news is that these ideas are gaining steam. The Administration added a batch of new initiatives the spectrum policy mix in last year's Executive Memorandum on Expanding America's Leadership in Wireless Innovation. In Congress, Representative Matsui and Representative Guthrie introduced a ground-breaking bipartisan bill that provides a framework for rewarding federal spectrum users for efficient use. This is a terrific bill that could have big impact.

Of course, this is all getting ahead of what we have right here, right now, today. But we need to look for new spectrum opportunities down the road, well before we have the auction of this 65 megahertz in the rear view mirror. Given the speed at which our wireless world is evolving, now is not a moment too soon.

Thank you to the Wireless Telecommunications Bureau for your hard work on this important auction—and spectrum auctions yet to come.

**STATEMENT OF
COMMISSIONER AJIT PAI**

Re: *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, GN Docket No. 13-185

After five years without a major spectrum auction, things are starting to turn around. Last month the Commission completed the auction of the long-fallow H Block, and today we adopt service rules so that we can auction off the AWS-3 spectrum before the year is over. This is good news.

It's good news because consumer demand for mobile broadband services has never been greater, and new commercial spectrum is needed to "fuel the investment that has made the United States the world leader in wireless innovation."¹

And it's good news because spectrum auctions can raise billions of dollars for national priorities identified by Congress in the Spectrum Act. Among those priorities are funding for state and local first responders, public safety research, deficit reduction, and next-generation 911 deployment—not to mention the funding of FirstNet.² We need to raise at least \$27.95 billion in net revenues if we are going to meet all of these challenges.

Even more good news: We're using the right type of auction to sell off the right spectrum. On the former point, we are maintaining open eligibility and uncapped participation, consistent with the Commission's firmly-rooted standard that sets a high bar to any bidding restrictions.³ In a long line of Commission cases, we have determined that eligibility restrictions may be imposed "only when open eligibility would pose a significant likelihood of substantial harm to competition in specific markets and when an eligibility restriction would be effective in eliminating that harm."⁴

On the latter point, we've paired the 1755–1780 MHz band with the 2155–2180 MHz band, which is adjacent to the existing AWS-1 band and already internationally harmonized for commercial use. Those characteristics should mean faster deployment and more efficient use of spectrum. Together, these choices make it more likely that we will have "robust competition, maximizing revenue through vigorous auction participation,"⁵ as called for by the leaders of the bipartisan Congressional Spectrum Caucus.

But there are a couple of catches: We are not clearing federal users out of the AWS-3 spectrum,

¹ Letter from House Energy and Commerce Committee Federal Spectrum Working Group to Lawrence Strickling, Assistant Secretary of Commerce for Communications at 1 (July 10, 2012), available at <http://go.usa.gov/gQ5d>.

² Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 126 Stat. 156 § 6413(b) (2012) (Spectrum Act), codified at 47 U.S.C. § 1457(b).

³ See, e.g., *Service Rules for Advanced Wireless Services in the 2000–2020 MHz and 2180–2200 MHz Bands*, WT Docket Nos. 12-70, 04-356, ET Docket No. 10-142, Report and Order and Order of Proposed Modification, 27 FCC Rcd 16102, 16193, para. 241 (2012) (*AWS-4 Order*); see also *Service Rules for the 698–746, 747–762 and 777–792 MHz Bands*, WT Docket No. 06-150, Second Report and Order, 22 FCC Rcd 15289, 15383-84, para. 256 (2007) (*700 MHz Second Report and Order*); *Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150–2162 and 2500–2690 MHz Bands*, Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd 14165, 14227–32, paras. 165–76 (2004); *Allocations and Service Rules for the 71–76 GHz, 81–86 GHz and 92–95 GHz Bands*, Report and Order, 18 FCC Rcd 23318, 23346, para. 69 (2003) (*70/80/90 GHz Order*) ("[E]ligibility restriction [may] be imposed only when there is significant likelihood of substantial harm to competition in specific markets and when the restriction will be effective in eliminating that harm.").

⁴ *AWS-4 Order*, 27 FCC Rcd at 16193, para. 241; see also *700 MHz Second Report and Order*, 22 FCC Rcd at 15383–84, para. 256; *70/80/90 GHz Order*, 18 FCC Rcd at 23346, para. 70.

⁵ See Letter from Hon. Brett Guthrie and Hon. Doris Matsui to Hon. Tom Wheeler, Chairman, FCC (Mar. 25, 2014), available at <http://go.usa.gov/KFhw>.

and we are giving the government greater access to 85 MHz of prime, commercial spectrum at 2025–2110 MHz. We do this despite that fact that the federal government is already the sole or “dominant” user of more than half the spectrum ideally suited for mobile broadband. That’s almost 1,300 MHz of spectrum where, as the President’s Council of Advisors on Science and Technology (PCAST) put it, government exclusivity or dominance “effectively precludes substantial commercial use.”⁶

This is bad news for the American public. The best way to maximize the value of spectrum in these types of bands, both at auction and for consumers, is to make it available for exclusive commercial use. That’s what we did in the early 2000s when the FCC and the National Telecommunications and Information Administration (NTIA) cleared federal users out of the 1710–1755 MHz band and conducted the tremendously successful AWS-1 auction. Clearing that spectrum cost less than originally assumed even without giving the government new spectrum to use. So consumers got more spectrum, and the Treasury got more funds.

Since then, Congress has placed even greater emphasis on clearing. In a subsection titled “Relocation Prioritized Over Sharing,” the Spectrum Act directs the NTIA to “choose options involving shared use only when it determines, in consultation with the Director of the Office of Management and Budget [OMB], that relocation is not feasible because of technical or cost constraints.”⁷ And if NTIA makes that determination, it *must* “notify [Congress] of the determination, including the specific technical or cost constraints on which the determination is based.”⁸ Consistent with these statutory requirements, the *AWS-3 NPRM* proposed to allocate the 1695–1710 and 1755–1780 MHz bands for shared use only “if clearing is not feasible.”⁹

The NTIA has not carried out these statutory duties—at least not yet. Although the Commission commenced the notification-and-auction process of the Commercial Spectrum Enhancement Act more than one year ago,¹⁰ NTIA has not yet notified Congress of its determination—assuming that one has been made in consultation with OMB.

And it’s far from certain whether clearing the 1755–1780 MHz band was ever seriously considered under the Spectrum Act standard. As the Commission readily acknowledges in this *Order*, NTIA charged the Commerce Spectrum Management Advisory Committee (CSMAC) working groups with “addressing sharing issues” related to the spectrum at hand, not clearing.¹¹ It also directed those

⁶ See President’s Council of Advisors on Science and Technology, Report to the President: Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth (rel. July 20, 2012) (PCAST Report); see also *Amendment of the Commission’s Rules with Regard to Commercial Operations in the 1695–1710 MHz, 1755–1780 MHz, and 2155–2180 MHz Bands*, GN Docket No. 13-185, Notice of Proposed Rulemaking and Order on Reconsideration, 28 FCC Rcd 11479, 11579–80 (2013) (Statement of Commissioner Ajit Pai, Approving in Part and Concurring in Part) (*AWS-3 NPRM*) (citing National Telecommunications and Information Administration, United States Frequency Allocations: The Radio Spectrum (Aug. 2011)).

⁷ Spectrum Act § 6701(a)(3) (amending Section 113(j) of the National Telecommunications and Information Administration Organization Act (47 U.S.C. § 923)).

⁸ Spectrum Act § 6701(a)(3), codified at 47 U.S.C. § 923(j)(2).

⁹ *AWS-3 NPRM*, 28 FCC Rcd at 11482, para. 2.

¹⁰ See Letter from Julius Genachowski, Chairman, FCC, to Lawrence E. Strickling, Assistant Secretary for Communications and Information, U.S. Department of Commerce, at 1 (March 20, 2013), *available at* <http://go.usa.gov/2VR5>; see also Testimony of Commissioner Ajit Pai, Hearing before the U.S. Senate Committee on Commerce, Science, and Transportation, “Oversight of the Federal Communications Commission” at 2–3 (Mar. 12, 2013) (calling on the Commission to “commence the notification-and-auction process now to preserve our ability to auction the 1755–1780 MHz spectrum paired with the 2155–2180 MHz spectrum”), *available at* <http://go.usa.gov/2Vj3>.

¹¹ *Order* at para. 9.

groups to use NTIA's Fast Track Report "as the bases for beginning" their discussions,¹² even though that Report was prepared to assess the feasibility of sharing, not clearing.¹³ And on the heels of this directive came the PCAST Report, which largely dismissed clearing as an option, as I noted at the time.¹⁴ These decisions beg the question of whether the law is effectively a dead letter.

None of this is to say that clearing and relocating federal users is easy. Federal agencies are focused on achieving their missions. And they often lack incentives to relocate and clear spectrum for commercial use. But whatever the challenges, the statute favors clearing, not sharing.

The fact that NTIA has yet to publicly determine that clearing these bands is not feasible puts us in a tight spot. We have a statutory deadline to auction and license the AWS-3 band, so we need to move forward with service rules so that wireless operators can begin planning their bids. But coming up with service rules requires a fair degree of clarity on the status of federal holdings. Getting that clarity, in turn, requires extensive communications with federal users, with NTIA as the go-between. So we end up in a game of telephone, made worse because we typically have to accept the government's say-so on the details of federal use.¹⁵ I hope we may find a better way, but for now we must muddle through.

I thank my colleagues on both sides of the aisle for accommodating some of my suggestions, such as including in this item a mechanism that will allow us to monitor the progress being made by those federal incumbents that are relocating. As we move closer to auctioning this spectrum, I look forward to working with my colleagues to ensure that federal incumbents provide thorough, substantive, and substantiated transition plans. Potential licensees must have adequate information about the nature and extent of incumbent operations in order to value the spectrum and formulate bids.

Finally, I cannot approve of the *Order's* adoption of an interoperability mandate on AWS-3 licensees given that the *AWS-3 NPRM* never proposed such a rule.¹⁶ Nevertheless, because that mandate

¹² See U.S. Department of Commerce, National Telecommunications and Information Administration, Framework for Work within CSMAC, available at <http://go.usa.gov/KMXC> (NTIA Framework); see also U.S. Department of Commerce, An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675–1710 MHz, 1755–1780 MHz, 3500–3650 MHz, 4200–4220 MHz, and 4380–4400 MHz Bands at 2-3–2-4 (Oct. 2010), available at <http://go.usa.gov/KM9z> (Fast Track Report).

¹³ Fast Track Report at 1-4 ("NTIA and the Federal agencies performed this Fast Track Evaluation . . . to evaluate four bands by October 1, 2010, to determine if any spectrum in these bands could be made available on a geographical sharing basis for wireless broadband use within five years."); see also *id.* ("This Fast Track Evaluation provides the analysis results for these candidate frequency bands and recommends the necessary actions that would be required to accommodate broadband wireless services on a shared basis.").

¹⁴ See Statement of Commissioner Ajit Pai on the Report of the President's Council of Advisors on Science and Technology (July 20, 2012), available at <http://go.usa.gov/KMaQ>.

¹⁵ In fact, the majority of the CSMAC members stated that "because only limited technical data was shared about Federal systems with the working groups, participants were not able to fully engage in the type of informed discussion of the analysis and underlying assumptions necessary to verify the accuracy of the information." See Separate Statement Concerning Working Group Reports for the 1755–1850 MHz Band (Aug. 29, 2013) available at <http://go.usa.gov/KM9P>. I should note as well that NTIA's Fast Track Report deferred making any recommendations regarding the 1755–1780 MHz band, and when NTIA later assessed the full 1755–1850 MHz band—reaching the conclusion that repurposing the entire 95 MHz would cost \$18 billion over 10 years—NTIA did not evaluate the possibility for clearing just the 1755–1780 MHz band. See U.S. Department of Commerce, An Assessment of the Viability of Accommodating Wireless Broadband in the 1755–1850 MHz Band (Mar. 2012), available at <http://go.usa.gov/KM9G>.

¹⁶ At best, the *AWS-3 NPRM* sought comment on possible technical or operational rules that would protect certain services "from harmful interference." See *AWS-3 NPRM*, 28 FCC Rcd at 11517, para. 85; *Order* at para. 225. But that section proposed to adopt the same technical requirements for AWS-3 that apply to AWS-1, and AWS-1 has no interoperability mandate. Neither that paragraph, nor any other portion of the *AWS-3 NPRM*, discusses or proposes an interoperability rule.

only spans the 1710–1780 MHz and 2110–2180 MHz bands, and because international standards to cover those bands are already being developed, I hope that error will be harmless.¹⁷

Many thanks to the team that negotiated for countless hours with their executive branch counterparts, drafted this item, and worked with my office over the past several weeks, including Richard Arsenault, Valerie Barrish, Peter Daronco, Connie Diaz, Nese Guendelsberger, David Horowitz, Bill Hueber, Julius Knapp, John Leibovitz, Paul Malmud, Gary Michaels, Tom Mooring, Brian Regan, Ron Repasi, Bill Richardson, Genevieve Ross, Blaise Scinto, Roger Sherman, John Spencer, Joel Taubenblatt, Jeffrey Tignor, Tom Tran, Brian Wondrack, Janet Young, Nancy Zaczek, and Stephen Zak. I hope your tireless efforts are rewarded with a successful AWS-3 auction later this year.

¹⁷ Of course, expanding that mandate to other spectrum bands may be positively harmful, and there is no emergency, to my knowledge, that could countenance such a violation of the Administrative Procedure Act.

**STATEMENT OF
COMMISSIONER MICHAEL P. O'RIELLY**

Re: *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, GN Docket No. 13-185

Today, we take another step to implement the "Spectrum Act" contained in the Middle Class Tax Relief and Job Creation Act of 2012 by making available to the commercial marketplace an additional 65 megahertz of much needed spectrum. These frequencies will be used to deliver high-speed mobile broadband and other wireless services that Americans demand.

The staff of the Wireless Telecommunications Bureau and Office of Engineering Technology did yeoman's work to get us to today's order and they deserve our highest gratitude. The Spectrum Act's upcoming February 2015 deadline put the Commission on a very tight timeline, especially given the fact that two bands identified for auction currently host important federal operations that need to be relocated. I am especially pleased that this order will enable us to auction 1755-1780 MHz paired with 2155-2180 MHz. These bands are not only ideal for wireless broadband, they are also globally harmonized, which means consumers stand to benefit as U.S. providers take advantage of the economies of scale in network equipment and overseas roaming. In the same vein, I would have preferred that we auction the uplink 1695-1710 MHz paired with a downlink band and, if necessary, had gone back to Congress to ask for a limited delay to achieve this, potentially generating more value for both the industry and auction proceeds.

While I am pleased that we have reached resolution on the major decisions that will enable us to move forward with an auction, I am concerned about the remaining issues that still need to be resolved. First, talks with NTIA will continue about the specifics of the transition plans and the technical parameters surrounding the temporary and permanent sharing zones that will be employed to protect legacy federal users. To ensure that Americans can realize the most benefit from this spectrum, the FCC and NTIA should continue to decrease the number and the size of the areas where AWS-3 licensees must coordinate during the relocation process and beyond.

Second, the Spectrum Act states Congress's strong preference for clearing over spectrum sharing. In fact, sharing is only allowed after NTIA determines, in consultation with the Director of the Office of Management and Budget, that relocation of federal operations from a band "is not feasible." And, even then, it must notify the relevant Congressional Committees with a written explanation of the specific technical or cost constraints that make clearing impracticable. I am very concerned that this has not yet happened. I hope that NTIA complies with the statute and provides Congress with an explanation for why federal users cannot ultimately vacate these bands.

Third, I am concerned about some of the remaining details surrounding the auction itself. The law states that, in order for the AWS-3 auction to be successful, it will have to generate enough revenue to cover 110 percent of the relocation costs. For these funds to be raised, auction participants need certainty in order to have the confidence to bid freely. Leading up to the auction, the FCC will have to keep the public informed about the factors that will affect providers' decision making, including reserve prices. In order to formulate business plans and bidding strategies, bidders will need to know the geographic scope and estimated time frame for relocating federal users. Most importantly, they will need to know how the spectrum screen will apply to this auction. The item defers this question to the mobile spectrum holdings proceeding. But, as I have said before, I will strongly oppose arbitrary spectrum caps or any spectrum screen that is not directly related to addressing undue power in a particular market. We simply cannot afford the risk of using that proceeding to give favored industry players an unwarranted discount on spectrum.

There are also a few aspects of the order upon which I must concur. First, I believe that the appointed and confirmed Commissioners should decide issues of importance before the Commission. But in response to concerns about the number of decisions that were delegated to the bureau-level, the final

item no longer contains any reference to delegated authority and leaves those decisions to be made at a future date. Having just gone through a number of instances when I requested to vote on an item, only to have it go out on delegated authority anyway, I remain skeptical that I will have the opportunity to vote on the upcoming decisions regarding AWS-3. Excessive reliance on delegation demeans the creditability of the Commission.

In addition, I am opposed to the item's discussion of extending interoperability to the AWS-4 band. Without adopting rules, the Commission here is telling industry that, absent technical impediments, we expect them to implement interoperability. If they do not, or "if the Commission determines that progress on interoperability has stalled in the standards process," the Commission may regulate. This is nothing more than stealth regulation. It just avoids the notice problems.

Again, I thank the dedicated staff in the Wireless Telecommunications Bureau and the Office of Engineering and Technology who made great strides in their negotiations with NTIA, and the other affected federal agencies, to get us here today.